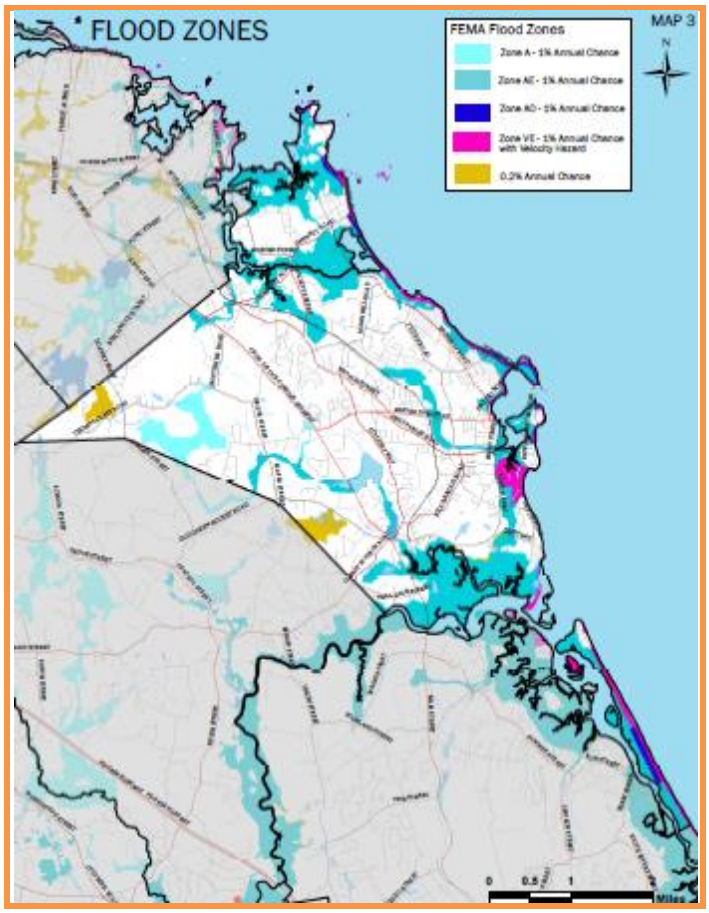
TOWN OF SCITUATE
HAZARD MITIGATION PLAN
2011 UPDATE



Metropolitan Area Planning Council

FINAL PLAN
Adopted June 28, 2011

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TOWN OF SCITUATE HAZARD MITIGATION PLAN 2011 UPDATE

ACKNOWLEDGEMENTS AND CREDITS

This plan was prepared for the Town of Scituate by the Metropolitan Area Planning Council (MAPC) under the direction of the Massachusetts Emergency Management Agency (MEMA) and the Massachusetts Department of Conservation and Recreation (DCR). The plan was funded by the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation (PDM) Grant Program.

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Hazard Mitigation planning is a proactive effort to identify actions that can be taken to reduce the dangers to life and property from natural hazard events. In the communities of the Boston region of Massachusetts, hazard mitigation planning tends to focus most on flooding, the most likely natural hazard to impact these communities. The Federal Disaster Mitigation Act of 2000 requires all municipalities that wish to be eligible to receive FEMA funding for hazard mitigation grants, to adopt a local multi-hazard mitigation plan and update this plan in five year intervals.

Planning Process

Planning for the Scituate Hazard Mitigation Plan update was led by the Scituate Local Hazard Mitigation Planning Committee, composed of staff from a number of different Town Departments. This committee discussed where the impacts of natural hazards most affect the Town, goals for addressing these impacts, and hazard mitigation measures that would benefit the Town.

Public participation in this planning process is important for improving awareness of the potential impacts of natural hazards and to build support for the actions the Town takes to mitigate them. The Town hosted two public meetings, the first on October 14 and the second on November 16 and the plan was posted on the Town's website for public review.

Risk Assessment

The Scituate Hazard Mitigation Plan assesses the potential impacts to the Town from flooding, high winds, winter storms, brush fire, and geologic hazards. Flooding, driven by hurricanes, northeasters and other storms, clearly presents the greatest hazard to the Town, most especially in the coastal areas where storm driven waves top the sea wall and flood adjacent low lying areas.

The Scituate Local Committee identified those areas where flooding most frequently occurs, comprising 9.16% of the Town's land area, and approximately 664 buildings worth an estimated $174,479,588.20.

Hazard Mitigation Goals

1. Ensure that critical infrastructure sites are protected from natural hazards.

2. Protect existing residential and business areas from flooding.

3. Maintain existing mitigation infrastructure in good condition.

4. Continue to enforce existing zoning and building regulations.

5. Educate the public about zoning and building regulations, particularly with regard to changes in regulations that may affect tear-downs and new construction.

6. Work with surrounding communities to ensure regional cooperation and solutions for hazards affecting multiple communities.

7. Encourage future development in areas that are not prone to natural hazards.

8. Educate the public about natural hazards and mitigation measures.

9. Make efficient use of public funds for hazard mitigation.

Hazard Mitigation Strategy

The Scituate Local Committee identified a number of mitigation measures that would serve to reduce the Town's vulnerability to natural hazard events. These include infrastructure improvements such as continued maintenance and repair to sea walls and culverts, continuation of the structure elevation program for floodplain properties, implementation of the Peggotty Beach Management Plan, and public education efforts relating to flooding and other natural hazards potentially impacting the Town.

Overall, the hazard mitigation strategy recognizes that mitigating hazards for Scituate will be an ongoing process as our understanding of natural hazards and the steps that can be taken to mitigate their damages changes over time. Global climate change, erosion of beaches, and a variety of other factors impact the Town's vulnerability, and local officials will need to work together across municipal lines and with state and federal agencies in order to understand and address these changes. The Hazard Mitigation Strategy will be incorporated into other related plans and policies.

Plan Review and Update Process

Table 1 Plan Review and Update

Chapter	Reviews and Updates
III – Planning Process & Public Participation	The Scituate Local Committee placed an emphasis on public participation for the update of the Hazard Mitigation Plan, discussing strategies to enhance participation opportunities at the first local committee meeting. During plan development, the plan was presented to the Planning Board and the Board of Selectmen in public meetings. The Board of Selectmen's meeting was televised and broadcast on the radio. The plan was also available on the Town's website for public comment.
IV – Risk Assessment	MAPC gathered the most recently available hazard and land use data and met with Town staff to identify changes in local hazard areas and development trends. Town staff reviewed critical infrastructure with MAPC staff in order to create an up-to-date list. MAPC also used the

	most recently available version of HAZUS and assessed the potential impacts of flooding using the latest data.
V - Goals	The Hazard Mitigation Goals were reviewed and endorsed by the Local Hazard Mitigation Committee.
VI – Existing Mitigation Measures	The list of existing mitigation measures was updated to reflect current mitigation activities in the Town.
VII & VIII – Hazard Mitigation Strategy	Mitigation measures from the 2005 plan were reviewed and assessed as to whether they were completed, In-Process, or deferred. The Local Committee determined whether to carry forward measures into the 2010 plan or delete them. The 2010 Hazard Mitigation Strategy reflects both new measures and measures carried forward from the 2005 plan. The Committee re-prioritized all of these measures based on current conditions.
IX – Plan Adoption & Maintenance	This section of the plan was updated with a new on-going plan implementation review and five year update process that will assist the Town in incorporating hazard mitigation issues into other Town planning and regulatory review processes and better prepare the Town to update the plan in 2016.

As indicated on Table 15, Scituate made considerable progress on implementing mitigation measures identified in the 2005 Hazard Mitigation Plan. Many of the measures identified in that plan are now considered on-going aspects of the regular work of Town staff from the department head level to the regular work of Public Works staff. Individual projects have been incorporated into the Town's capital improvement plan and the Town continues to seek FEMA grant funding to implement the home elevation program. Moving forward into the next five year plan implementation period there will be many more opportunities to incorporate hazard mitigation into the Town's decision making processes.

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II. INTRODUCTION

Planning Requirements under the Federal Disaster Mitigation Act

The Federal Disaster Mitigation Act, passed in 2000, requires that after November 1 2004, all municipalities that wish to continue to be eligible to receive FEMA funding for hazard mitigation grants, must adopt a local multi-hazard mitigation plan and update this plan in five year intervals. This planning requirement does not affect disaster assistance funding.

Massachusetts has taken a regional approach and has encouraged the regional planning agencies to apply for grants to prepare plans for groups of their member communities. The Metropolitan Area Planning Council (MAPC) received a grant from the Federal Emergency Management Agency (FEMA) under the Pre-Disaster Mitigation (PDM) Program, to assist the Town of Scituate and nine other South Shore communities to update their local Hazard Mitigation Plans, which were first adopted in as part of a South Shore Regional Hazard Mitigation Plan. The local Hazard Mitigation Plan updates produced under this grant are designed to individually meet the requirements of the Disaster Mitigation Act for each community.

In order to address multijurisdictional and regional issues, the participating municipalities were afforded the opportunity to meet with their neighboring communities during plan development, and MAPC has also produced a regional document that summarizes the issues and recommendations for the South Shore communities.

What is a Hazard Mitigation Plan?

Natural hazard mitigation planning is the process of determining how to systematically reduce or eliminate the loss of life and property damage resulting from natural hazards such as floods, earthquakes, and hurricanes. Hazard mitigation means to permanently reduce or alleviate the losses of life, injuries, and property resulting from natural hazards through long-term strategies. These long-term strategies include planning, policy changes, programs, projects, and other activities.

Previous Federal/State Disasters

The Town of Scituate has experienced 17 natural hazards that triggered federal or state disaster declarations since 1991. These are listed in Table 1 below. The vast majority of these events involved flooding.

Table 2 Previous Federal/State Disaster Declarations

DISASTER NAME (DATE OF EVENT)	TYPE OF ASSISTANCE	DECLARED AREAS
Hurricane Bob (August 1991)	FEMA Public Assistance Project Grants	Counties of Barnstable, Bristol, Dukes, Essex, Hampden, Middlesex, Plymouth, Nantucket, Norfolk, Suffolk
	Hazard Mitigation Grant Program	Counties of Barnstable, Bristol, Dukes, Essex, Hampden, Middlesex, Plymouth, Nantucket, Norfolk, Suffolk (16 projects)
No-Name Storm (October 1991)	FEMA Public Assistance Project Grants	Counties of Barnstable, Bristol, Dukes, Essex, Middlesex, Plymouth, Nantucket, Norfolk
	FEMA Individual Household Program	Counties of Barnstable, Bristol, Dukes, Essex, Middlesex, Plymouth, Nantucket, Norfolk
	Hazard Mitigation Grant Program	Counties of Barnstable, Bristol, Dukes, Essex, Middlesex, Plymouth, Nantucket, Norfolk, Suffolk (10 projects)
December Blizzard (December 1992)	FEMA Public Assistance Project Grants	Counties of Barnstable, Dukes, Essex, Plymouth, Suffolk
	Hazard Mitigation Grant Program	Counties of Barnstable, Dukes, Essex, Plymouth, Suffolk (7 projects)
March Blizzard (March 1993)	FEMA Public Assistance Project Grants	All 14 Counties
January Blizzard (January 1996)	FEMA Public Assistance Project Grants	All 14 Counties
May Windstorm (May 1996)	State Public Assistance Project Grants	Counties of Plymouth, Norfolk, Bristol (27 communities)

DISASTER NAME (DATE OF EVENT)	TYPE OF ASSISTANCE	DECLARED AREAS
October Flood (October 1996)	FEMA Public Assistance Project Grants	Counties of Essex, Middlesex, Norfolk, Plymouth, Suffolk
	FEMA Individual Household Program	Counties of Essex, Middlesex, Norfolk, Plymouth, Suffolk
	Hazard Mitigation Grant Program	Counties of Essex, Middlesex, Norfolk, Plymouth, Suffolk (36 projects)
1997	Community Development Block Grant-HUD	Counties of Essex, Middlesex, Norfolk, Plymouth, Suffolk
June Flood (June 1998)	FEMA Individual Household Program	Counties of Bristol, Essex, Middlesex, Norfolk, Suffolk, Plymouth, Worcester
	Hazard Mitigation Grant Program	Counties of Bristol, Essex, Middlesex, Norfolk, Suffolk, Plymouth, Worcester (19 projects)
(1998)`	Community Development Block Grant-HUD	Counties of Bristol, Essex, Middlesex, Norfolk, Suffolk, Plymouth, Worcester
March Flood (March 2001)	FEMA Individual Household Program	Counties of Bristol, Essex, Middlesex, Norfolk, Suffolk, Plymouth, Worcester
	Hazard Mitigation Grant Program	Counties of Bristol, Essex, Middlesex, Norfolk, Suffolk, Plymouth, Worcester (16 projects)
February Snowstorm (Feb 17-18, 2003)	FEMA Public Assistance Project Grants	All 14 Counties
January Blizzard (January 22-23, 2005)	FEMA Public Assistance Project Grants	All 14 Counties
Hurricane Katrina (August 29, 2005)	FEMA Public Assistance Project Grants	All 14 Counties
May Rainstorm/Flood (May 12-23, 2006)	Hazard Mitigation Grant Program	Statewide

DISASTER NAME (DATE OF EVENT)	TYPE OF ASSISTANCE	DECLARED AREAS
April Nor'easter (April 15-27, 2007)	FEMA Public Assistance Project Grants	Barnstable, Berkshire, Dukes, Essex, Franklin, Hampden, Hampshire, Plymouth
	Hazard Mitigation Grant Program	Statewide
Flooding (March, 2010)	FEMA Public Assistance FEMA Individuals and Households Program SBA Loan	Bristol, Essex, Middlesex, Suffolk, Norfolk, Plymouth, Worcester
	Hazard Mitigation Grant Program	Statewide

(Source: database provided by MEMA)

FEMA Funded Mitigation Projects

Over the last 20 years the Town of Scituate has received funding from FEMA for 12 mitigation projects under the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance (FMA) program, and the Severe Repetitive Loss (SRL) program. These projects totaled $4,267,109 with $2,537,178.73 covered by FEMA grants and $1,125,731.10 by local funding. The projects are summarized in Table 3 below.

Table 3 FEMA-Funded Mitigation Projects

Year	Project Title	Scope of Work	Total Cost	Federal Funding	Local Funding
	Elevation/Retrofit of Rep Loss Properties (FMA)	Retrofitting utilities for aprox 12 homes to an elevation above base flood.	$580,000.00	$158,209.00	$377,005.00
	Elevation/Retrofit of Rep Loss Properties (FMA)	Retrofit of utilities above BFE of 5 repetitive loss properties	$375,175.00	$119,533.00	$178,885.00
	Residential Elevation/Retrofit Project (FMA)	Following properties: 48 Oceanside Drive, 91 Oceanside Drive, 4 Dickens Row, etc	$582,000.00	$182,585.75	$145,500.00
	Repetitive Loss Structures (FMA)	Elevate/Retrofit various locations	$280,000.00	$210,000.00	$70,000.00

Year	Project Title	Scope of Work	Total Cost	Federal Funding	Local Funding
	Elevation/ Floodproofing (FMA)	Program for homeowners to modify structures to prevent future flooding	$357,867.00	$249,000.00	$89,467.00
	Elevation/ Floodproofing (Phase II) (FMA)	Program allowing owners of qualified flood zone property to modify the structures	$299,531.00	$198,715.08	$74,883.00
	Flood Mitigation Plan (FMA)	Comprehensive flood mitigation plan	$20,000.00	$12,930.00	$5,000.00
2005	Homeowner Floodproofing Program (HMGP)	Various homes	$588,556.00	$390,000.00	$0.00
2001 March Flood	Jericho Road Ocean Outfall (HMGP)	Drain pipe with new inlet and outlet head structure under Jericho Road	$284,358.00	$239,044.00	$71,090.00
1991 No-Name Storm	Acquisition / Demolition (HMGP)	Acquisition of properties; relocation or demolition	$154,371.00	$110,000.00	$36,663.00
1991 No-Name Storm	Jericho Road Drainage (HMGP)	Replace existing drain line under Jericho Road and install a new headwall	$19,510.00	$13,995.00	$4,664.00
	Elevate 4 SRL Properties (SRL)	Elevate 4 SRL properties	$725,741.00	$653,166.90	$72,574.10

(Source: database provided by MEMA)

Community Profile

Scituate is a mid-sized seacoast community located equidistant between Boston and Plymouth. In the nearly 400 years since its incorporation, it has evolved from a summer colony to a residential community. There are about 18,000 year round residents today. Ocean-related recreational activities make it a very desirable place in which to live and to raise families. Its Town Pier accommodates a working fishing fleet and three business areas. The town maintains a website at http://www.town.scituate.ma.us

Storms have had a profound impact on the nature of the Town. In November of 1898, the shores of Scituate were struck by the Portland Gale, one of the most severe storms of the century. Continuous, intense wave action during this extreme storm breached the connection between a long peninsula of barrier beach to the south and the rest of the Town. This resulted in the separation of Humarock, which has remained part of Scituate but is accessible only through the Town of Marshfield. The Town has one of the largest number of repetitive loss properties in the state, reflecting the continuing impact of storms and flooding on the Town.

III. PLANNING PROCESS AND PUBLIC PARTICIPATION

Public participation occurred at two levels; the South Shore Multiple Hazard Community Planning Team (regional committee) and the Scituate Multiple Hazard Community Planning Team (local committee). In addition, the town held one meeting open to the general public to present the plan and hear citizen input.

Scituate's Participation in the Regional Committee

On January 15, 2010 a letter was sent notifying the communities of the first meeting of the South Shore Regional Committee and requesting that the Chief Elected Official designate a minimum of two municipal employees and/or officials to represent the community. The following individuals were appointed to represent Scituate on the regional committee:

Laura Harbottle	Planning Director

The South Shore Regional Committee met on the following dates:

February 9, 2010

The Local Multiple Hazard Community Planning Team

In addition to the regional committee meetings, MAPC worked with the local community representatives to organize a local Multiple Hazard Community Planning Team for Scituate (local committee). MAPC briefed the local representatives as to the desired composition of that team as well as the need for representation from the business community and citizens at large.

The Local Multiple Hazard Community Planning Team Meetings

On September 14, 2010, and October 19, 2010 MAPC conducted the meetings of the Scituate Local Committee. The meetings were organized by Laura Harbottle, Planning Director. The purpose of the first meeting was to introduce the PDM program, develop hazard mitigation goals, and to gather information on local hazard mitigation issues and sites or areas related to these. The second meeting focused on verifying information gathered by MAPC staff and discussion of existing mitigation practices, the status of mitigation measures identified in the 2005 hazard mitigation plan, and potential mitigation measures. The second meeting concluded with prioritization of proposed mitigation measures as well as measures carried forward from the previous plan. Table 4 lists the attendees at each meeting of the team. The agendas for these meetings are included in Appendix A.

Table 4 Attendance at the Scituate Local Committee Meeting	
Name	**Representing**
September 14, 2010	
Laura Harbottle, AICP	Planning Department
Richard Judge	Fire Department/Emergency Management
Paul Shea	Conservation Commission
Jennifer Sullivan	Board of Health
October 19, 2010	
Laura Harbottle, AICP	Planning Department
Richard Judge	Fire Department/Emergency Management
Jennifer Sullivan	Board of Health
Neil Duggan	Building Commissioner

Public Meetings

The plan was introduced to the public at two public meetings, once during the planning process and once after a final draft plan was completed. The public had an opportunity to provide input to the planning process during a meeting of the Planning Board, on October 14, 2010 held in the Scituate Town Hall. The final draft of the plan was presented at a Board of Selectmen's meeting held on November 16, 2010. This meeting was also held in the Scituate Town Hall. The Board of Selectmen's meeting was video-taped for showing on the Scituate cable channel and recorded for broadcast on a local radio station.

The first meeting was publicized as a regular meeting of the Scituate Planning Board. In addition, notice was sent to a number of organizations representing residents and businesses in the Town, with particular emphasis on those representing beachfront neighborhoods. The presentation of the final draft was publicized as a regular Selectmen's meeting. The attendance list for each meeting can be found in Table 5.

Table 5
Attendance at Public Meetings

Name	Representing
First Public Meeting	
William Limbacher, Chairman	Scituate Planning Board
Daniel Monger, Vice-Chairman	Scituate Planning Board
Dr. Nico Afanasenko, Clerk	Scituate Planning Board
Robert Vogel	Scituate Planning Board
Eric Mercer	Scituate Planning Board
Richard Taylor	Scituate Planning Board

Dave Ball	Cedar Point Beach Association
Jim Bailey, Vice Chair	Scituate Sea Wall Committee
James Freas	MAPC
Second Public Meeting	
John F. Danehey, Chairman	Scituate Board of Selectmen
Joseph P. Norton, Vice Chairman	Scituate Board of Selectmen
Anthony V. Vegnani	Scituate Board of Selectmen
Shawn Harris	Scituate Board of Selectmen
Richard W. Murray	Scituate Board of Selectmen
Patricia A. Vinchesi	Town Administrator
Laura Harbottle	Town Planner
Richard Judge	Fire Chief
James Freas	MAPC

Other Opportunities for Public Involvement

Website

Draft copies of the Scituate Hazard Mitigation Plan were posted on the Town's website and updated regularly over the course of the planning process. Members of the public could access the draft document and submit comments or questions.

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IV. RISK ASSESSMENT

The risk assessment analyzes the potential natural hazards that could occur within the Town of Scituate as well as the relationship between those hazards and current land uses, potential future development, and critical infrastructure. This section also includes a vulnerability assessment that estimates the potential damages that could result from certain large scale natural hazard events.

Update Process

In order to update Scituate's risk assessment, MAPC gathered the most recently available hazard and land use data and met with Town staff to identify changes in local hazard areas and development trends. MAPC also used the most recently available version of HAZUS (described below).

Overview of Hazards and Impacts

The Massachusetts Hazard Mitigation Plan 2007 (state plan) provides an in-depth overview of natural hazards in Massachusetts. The state plan indicates that Massachusetts is subject to the following natural hazards (listed in order of frequency); floods, heavy rainstorms, nor'easters or winter storms, coastal erosion, hurricanes, tornadoes, urban and wildfires, drought and earthquakes. Previous state and federal disaster declarations since 1991 are summarized in Table 1.

Table 6 summarizes the hazard risks for Scituate. This evaluation takes into account the frequency of the hazard, historical records, and variations in land use. This analysis is based on the vulnerability assessment in the Commonwealth of Massachusetts State Hazard Mitigation Plan, 2007. The statewide assessment was modified to reflect local conditions in Scituate using the definitions for hazard frequency and severity listed below Table 6.

Table 6
Hazard Risks Summary

Hazard	Frequency	Severity
Flood	High	Serious
Dam Failure	Low	Serious
Wind		
Hurricanes	Medium	Serious
Tornadoes	Low	Serious
Winter storms	High	Serious
Brush Fire	Medium	Minor
Geologic		
Earthquakes	Low	Extensive
Landslides	Low	Minor

Definitions used in the Commonwealth of Massachusetts State Hazard Mitigation Plan

Frequency

Very low frequency: events that occur less frequently than once in 1,000 years (less than 0.1% per year)

Low frequency: events that occur from once in 100 years to once in 1,000 years (0.1% to 1% per year);

Medium frequency: events that occur from once in 10 years to once in 100 years (1% to 10% per year);

High frequency: events that occur more frequently than once in 10 years (greater than 10% per year).

Severity

Minor: Limited and scattered property damage; no damage to public infrastructure (roads, bridges, trains, airports, public parks, etc.); contained geographic area (i.e.one or two communities); essential services (utilities, hospitals, schools, etc) not interrupted; no injuries or fatalities.

Serious: Scattered major property damage (more than 50% destroyed); some minor infrastructure damage; wider geographic area (several communities); essential services are briefly interrupted; some injuries and/or fatalities.

Extensive: Consistent major property damage; major damage public infrastructure damage (up to several days for repairs); essential services are interrupted from several hours to several days; many injuries and fatalities.

Catastrophic: Property and public infrastructure destroyed; essential services stopped, thousands of injuries and fatalities.

Flood Related Hazards

Flooding was the most prevalent serious natural hazard identified by local officials in Scituate. Flooding is generally caused by hurricanes, nor'easters, severe rainstorms, and, thunderstorms. Sea level rise has the potential to exacerbate these issues over time.

Regionally Significant Floods

There have been a number of major floods that have affected the South Shore region over the last fifty years. Significant historic flood events in Scituate have included:

- March 1968
- The blizzard of 1978
- January 1979
- April 1987
- October 1991 ("The Perfect Storm")
- October 1996

- June 1998
- March 2001
- April 2004
- May 2006
- April 2007
- March 2010

Overview of Town-Wide Flooding

The Town of Scituate is subject to two kinds of flooding; coastal flooding where wind and tide leads to flooding along the shore and tidal waterways and inland flooding where the rate of precipitation or amount of water overwhelms the capacity of natural and structured drainage systems to convey water causing it to overflow the system. These two types of flooding are often combined as inland flooding is prevented from draining by the push of wind and tide driven water. Both types of flooding can be caused by major storms, known as northeasters and hurricanes. Northeasters can occur at any time of the year but they are most common in winter. Hurricanes are most common in the summer and early fall. Scituate, being north of Cape Cod, is particularly vulnerable to northeasters because the area is not protected by the sheltering arm of Cape Cod. Northeasters cover a larger area than hurricanes although the winds are not as high. They also generally last long enough to include at least one high tide, which causes the most severe flooding. Large rain storms or snowfalls can also lead to inland flooding.

The frequency and locations of flood hazard events in Scituate can be estimated based on the reported loss occurrences for repetitive loss properties and from local knowledge captured through discussion with local staff and the public during identification of local flood hazard areas. Based on these factors, flooding occurs most often along the coast in the low area behind the seawalls and former dunes, with particular frequency at Lighthouse Point, Surfside Road, Minot Beach, Peggoty Beach, and Humarock. Reported losses on repetitive loss properties indicate that a flood event resulting in property damage occurs on average nearly twice a year, though there are stretches of time over the last 30 years of up to a couple years during which flooding of this extent did not occur. In particular, winter storms in 1978, 1979, 1987, 1991, 1992, 2001, 2003 (twice), 2007, and most recently, in December, 2010, all led to extensive flood insurance claims in Scituate's coastal areas.

Potential Flood Hazard Areas

Information on potential flood hazard areas was taken from two sources. The first was the National Flood Insurance Rate Maps. The FIRM flood zones (draft) are shown on Map 3 in Appendix B. The second was discussions with local officials. The Locally Identified Areas of Flooding described below were identified by Town staff as areas where flooding is known to occur. These areas do not necessarily coincide with the flood zones from the FIRM maps. They may be areas that flood due to inadequate drainage systems or other local conditions rather than location within a flood zone. The numbers

correspond to the numbers on Map 8, "Hazard Areas". The numbers do not reflect priority order.

Locally Identified Areas of Flooding

1. Glades Road / Minot Beach – Much of the flooding in this area and the following coastal areas (#s 2 – 5) is the result of coastal storms where water washes over the sea wall and collects in low-lying areas in the roads and properties beyond.

2. Surfside Road

3. Oceanside Drive & Lighthouse Point – Improvements to drainage infrastructure around the proving grounds area have contributed to faster drainage in this area.

4. Peggotty Beach

5. Humarock

6. Maple Avenue – Inland storm driven flooding.

7. First Parish Road

8. Glades Estate – The road in this area washes out during significant storms.

9. Gannett Road

10. Scituate Harbor – A northeast wind combined with rain can lead to flooding around the harbor as water is pushed into this enclosed area.

11. Chief Justice Cushing Highway

12. Buttonwood Lane & Bayberry

<u>Repetitive Loss Structures</u>

There are 503 repetitive loss structures in Scituate, an increase from the 435 structures identified in the 2005 plan. As defined by the Community Rating System (CRS) of the National Flood Insurance Program (NFIP), a repetitive loss property is any property which the NFIP has paid two or more flood claims of $1,000 or more in any given 10-year period since 1978. For more information on repetitive losses see http://www.fema.gov/business/nfip/replps.shtm.

The majority of the repetitive loss properties in Scituate are single family homes, though several multi-family and commercial structures can be found in the FEMA flood zone A and other areas identified for frequent flooding. The table below shows the breakdown of structure type by FEMA designated and locally identified flood zones.

Table 7
Repetitive Loss Properties Summary

Flood Zone	Single Family Residential Structures	Multi-Family Residential Structures	Commercial, Industrial, or Institutional Structures	Total Repetitive Loss Properties
FEMA Zone A	314	13	11	338
FEMA Zone VE	78	5	1	84
FEMA .2% annual chance	0	0	0	0
Total: FEMA Flood Zones*	**392**	**18**	**12**	**422**
Glades Road / Minot Beach	27	4	2	33
Surfside Road	49	6	0	55
Oceanside Drive & Lighthouse Point	240	4	2	246
Peggotty Beach	12	0	0	12
Humarock	93	3	1	97
Maple Avenue	0	0	0	0
First Parish Road	0	0	0	0
Glades Estate	0	0	0	0
Gannett Road	0	0	0	0
Scituate Harbor	1	0	4	5
Chief Justice Cushing Road	0	0	0	0
Buttonwood Lane & Bayberry	5	0	0	5
Total: Locally Identified Areas of Flooding*	**427**	**17**	**9**	**453**

* Note totals for repetitive loss properties in FEMA flood zones and locally identified areas of flooding do not necessarily match the total number of repetitive loss properties in the community as there is considerable overlap between the two types of flood area and not all repetitive loss properties are located in an identified flood zone.

Sea Wall Failure and Coastal Erosion

Sea wall failure and coastal erosion are related issues increasingly impacting towns along the Massachusetts coast. Rising sea levels have led to increased rates of erosion along beaches and coastlines and the undermining of sea walls, some of which in the Boston region are many decades old. Sea walls protect the buildings behind them from storm damage and their failure can lead to increased property damage. Similarly, intact beaches with dunes dissipate wave energy, protecting buildings behind them. As the beaches erode away, this protection is lost. In some cases, sea walls can accelerate beach erosion. In April of 2010, 500 feet of sea wall in the neighboring Town of Marshfield collapsed due to undermining of its foundation from erosion. Sea wall damage in various locations was reported in Scituate as a result of the December, 2010 storm.

FEMA has indicated in their latest rules post hazard event reconstruction or repair funding for coastal protection structures will only be made available where the damage can be directly attributed to the storm event. Therefore, in order to receive this funding, the Town must maintain records of maintenance and repair activities that demonstrate the status of each structure.

Dams and Dam Failure

The Department of Conservation and Recreation (DCR) Office of Dam Safety lists 6 dams in Scituate. Three of the dams are rated as non-jurisdictional, two of these dams are rated as Significant Hazard and one is rated as High Hazard.

Dam failure can arise from two types of situations. Dams can fail because of structural problems independent of any storm event. Dam failure can follow an earthquake by causing structural damage. Dams can fail structurally because of flooding arising from a storm or they can overspill due to flooding.

In the event of a dam failure, the energy of the water stored behind even a small dam can cause loss of life and property damage if there are people or buildings downstream. The number of fatalities from a dam failure depends on the amount of warning provided to the population and the number of people in the area in the path of the dam's floodwaters. Dam failure in general is infrequent but has the potential for severe impacts. An issue for dams in Massachusetts is that many were built in the 19th century without the benefits of modern engineering or construction oversight.

The Massachusetts DCR has three hazard classifications for dams:

High Hazard:	Dams located where failure or mis-operation will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).
Significant Hazard:	Dams located where failure or mis-operation may cause loss of life and damage home(s), industrial or commercial facilities, secondary

highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities.

Low Hazard: Dams located where failure or mis-operation may cause minimal property damage to others. Loss of life is not expected.

In general, DCR requires that dams that are rated as low hazard be inspected every ten years while dams that are rated as significant hazards must be inspected every five years. All of the dams listed below are inspected annually.

First Herring Brook Dam – DCR lists the First Herring Brook Dam as a High Hazard dam. Owned by the Town, this dam is an old earthen dam.

Mordecai Lincoln Road Dam – The Mordecai Lincoln Road dam is privately owned and listed by DCR as a significant hazard. The dam is primarily an earthen structure with a road and was rebuilt four to five years ago.

Old Oaken Bucket Pond Dam – The Old Oaken Bucket Pond Dam is listed by DCR as a significant hazard. The dam is an earthen structure and owned by the Town.

In addition to dams located within the Town, the Bound Brook Control Dam located in Cohasset could have an impact on Scituate, should it fail. The predicted inundation zone of this dam includes the North Scituate area. Recent studies of the dam indicate it is in need of repair with the potential for dam failure. The Town of Cohasset has identified the replacement of this dam as a high priority action and is actively taking steps to address this issue.

Wind Related Hazards

Wind-related hazards include hurricanes and tornadoes as well as high winds during severe rainstorms and thunderstorms. As with many communities, falling trees that result in downed power lines and power outages are an issue in Scituate. Information on wind related hazards can be found on Map 5 in Appendix B.

Hurricanes

Since 1900, 39 tropical storms have impacted New England (NESEC). Massachusetts has experienced approximately 32 tropical storms, nine Category 1 hurricanes, five Category 2 hurricanes and one Category 3 hurricane. This equates to a frequency of once every six years. A hurricane or storm track is the line that delineates the path of the eye of a hurricane or tropical storm. There has been one recorded hurricane track through Scituate, Hurricane Bob, recorded in 1991. This category 2 storm passed across the northern end of the Town. The Town experiences the impacts of the wind and rain of hurricanes and tropical storms regardless of whether the storm track passed through the town. The hazard mapping indicates that the 100 year wind speed is 110 miles per hour.

Some of the hurricanes that have passed through the region include:

Great New England Hurricane*	September 21, 1938
Great Atlantic Hurricane*	September 14-15, 1944
Hurricane Doug	September 11-12, 1950
Hurricane Carol*	August 31, 1954
Hurricane Edna*	September 11, 1954
Hurricane Hazel	October 15, 1954
Hurricane Diane	August 17-19, 1955
Hurricane Donna	September 12, 1960
Hurricane Gloria	September 27, 1985
Hurricane Bob	August 19, 1991

*Category 3

Given its Coastal location, the town is highly vulnerable to hurricanes. A hurricane is a violent wind and rainstorm with wind speeds of 74-200 miles per hour. A hurricane is strongest as it travels over the ocean and is particularly destructive to coastal property as the storm hits the land. Hurricanes generally occur between June and November.

Tornados

On average, there are six tornadoes that touchdown somewhere in the northeast region every year. Tornadoes are most common in the summer, June through August and most form in the afternoon or evening. Tornadoes are associated with strong thunderstorms. The strongest tornado in Massachusetts history was the Worcester Tornado in 1953 (NESEC). There has been one recorded tornado within the Town limits, occurring near the harbor just northeast of the intersection of Beaver Dam and Hatherly Roads.

Winter Storms

Winter storms are the most common and most familiar of the region's hazards that affect large geographic areas. The majority of blizzards and ice storms in the region cause more inconvenience than they do serious property damage, injuries, or deaths. However, periodically, a storm will occur which is a true disaster, and necessitates intense large-scale emergency response. Occasionally winter storms can also hinder the tidal exchange in tidally restricted watersheds and result in localized flooding within these areas. Ice build-up at gate structures can also damage tide gates and increase the hazard potential as a result of malfunctioning tide gates.

In Massachusetts, northeast coastal storms known as nor'easters occur 1-2 times per year. Winter storms are a combination hazard because they often involve wind, ice and heavy snow fall. The average annual snowfall for most of the Town is 36.1 - 48 inches.

The most significant winter storm in recent history was the "Blizzard of 1978," which resulted in over 3 feet of snowfall and multiple day closures of roadways, businesses, and schools. Historically, severe winter storms have occurred in the following years:

Blizzard of 1978	February 1978
Blizzard	March 1993
Blizzard	January 1996
Severe Snow Storm	March 2001
Severe Snow Storm	December 2003
Severe Snow Storm	January 2005
Severe Snow Storm	December 2010
Severe Snow Storm	January 2011

Massachusetts experienced a record year for snowfall in 2008. By the end of the February 2008, Boston's Logan International Airport broke a new February record for total precipitation. In March 2008, many cities and towns in Massachusetts exceeded the highest snowfall records. The above-average snowfall that season increased groundwater and surface water levels to a high level, and contributed to flooding experienced in spring 2008.

Snowfall in winter 2010-11 has also approached the record mark with 60.3 inches measured at Logan for the season as of the end of January. Snow came in a series of severe storms, some of which included serious flooding in the South Shore area. The current winter snowfall record is 107.6 inches set in 1996-96.

Information on winter storm related hazards can be found on Map 6 in Appendix B.

Brush Fire Related Hazards

The Scituate Fire Department responds to approximately 7 - 10 wildfires annually. Scituate's forests are primarily composed of pitch pine, mixed conifer, oak, and oak mixed, which are considered by the State fire officials to be the forest types at highest risk for wildfires. Much of Scituate's forested area is wetlands, which has limited the ability of these fires to grow and spread.

Within the past year there were no wildfires that resulted in significant property damage. The most common cause of fires in Scituate is the careless disposal of smoking materials. The following areas of Town were identified as having the highest potential for brush fires. The numbers correspond to the numbers on Map 8, "Hazard Areas":

13. The Glades

14. Western Scituate

Geologic Hazards

Geologic hazards include earthquakes, landslides, sinkhole, subsidence, and unstable soils such as fill, peat, and clay. Although new construction under the most recent building codes generally will be built to seismic standards, there are still many structures

which pre-date the most recent building code. Information on geologic hazards can be found on Map 4 in Appendix B.

Earthquakes

Damage in an earthquake stems from ground motion, surface faulting, and ground failure in which weak or unstable soils, such as those composed primarily of saturated sand or silts, liquefy. The effects of an earthquake are mitigated by distance and ground materials between the epicenter and a given location. An earthquake in New England affects a much wider area than a similar earthquake in California due to New England's solid bedrock geology (NESEC). According to the Boston College Weston Observatory, in most parts of New England, there is a one in ten chance that, a potentially damaging earthquake will occur in a 50 year time period.

According to the State Hazard Mitigation Plan, New England experiences an average of five earthquakes per year. From 1668 to 2007, 355 earthquakes were recorded in Massachusetts (NESEC). The region has experienced larger earthquakes, including a magnitude 6.0 quake that struck in 1755 off the coast of Cape Anne. More recently, a pair of damaging earthquakes occurred near Ossipee, NH in 1940.

Earthquake Impacts – Earthquakes are a hazard with multiple impacts beyond the obvious building collapse. Buildings may suffer structural damage which may or may not be readily apparent. Earthquakes can cause major damage to roadways, making emergency response difficult. Water lines and gas lines can break, causing flooding and fires. Another potential vulnerability is equipment within structures. For example, a hospital may be structurally engineered to withstand an earthquake, but if the equipment inside the building is not properly secured, the operations at the hospital could be severely impacted during an earthquake. Earthquakes can also trigger landslides.

Landslides

Landslides can result from human activities that destabilize an area or can occur as a secondary impact from another natural hazard such as flooding. In addition to structural damage to buildings and the blockage of transportation corridors, landslides can lead to sedimentation of water bodies.

The majority of the Town has been classified as having a low risk for landslides. According to State data, there is a moderate landslide risk in the northeastern corner of the Town. There are no recorded instances of landslides having occurred in the Town of Scituate.

Land Use and Development Trends

Existing Land Use

The most recent land use statistics available from the state are from aerial photography done in 2005. Table 8 shows the acreage and percentage of land in 10 categories. If the three residential categories are aggregated, residential uses make up 33.69% of the area of the town (3,734.2 acres). The highest percentage is undeveloped wetlands which comprises 29.7% (3,291.36 acres).

Table 8
2005 Land Use

Land Use Type	Acres	Percent
High Density Residential	457.78	4.13
Medium Density Residential	911.02	8.22
Low Density Residential	2,365.4	21.34
Non-Residential, Developed	468.23	4.22
Commercial	82.51	.74
Industrial	70.51	.64
Transportation	19.01	.17
Agriculture	172.98	1.56
Undeveloped	3,244.96	29.28
Undeveloped Wetland	3,291.36	29.7
Total	***11,083.75***	***100.00***

Historic, Cultural, and Natural Resource Areas

As one of the original Plymouth Colony settlements, there are a number of sites of historic prominence. Four of the most important are the Scituate Lighthouse, Lawson Tower, the Old Oaken Bucket House, and the Maritime and Irish Mossing Museum.

Development Trends

Under current zoning, the Town of Scituate is largely built out. Much of the land area is occupied by existing subdivisions, commercial areas, conservation land, and undevelopable wetlands and floodplain areas. The development that is occurring in the Town is largely infill development of small subdivisions with up to 20 new single family homes on parcels reflecting a suburban development pattern. Development pressure on this remaining open developable land is strong.

Potential Future Development

MAPC consulted with town staff to determine areas that are likely to be developed in the future, defined for the purposes of this plan as a ten year time horizon. These areas are shown on Map 2, "Potential Development" and are described below. The letter for each site corresponds to the letters on Map 2.

A. River Club

B. Clapp Road

C. Holly Crest

D. Whitcomb Pines

E. Proving Grounds

F. Area off of 3A

G. Deer Common

H. First Parish Road

I. Tilden Woods

J. Maritime Education Center

K. Glades Estate

L. Indian Trail

Future Development in Hazard Areas

Table 9 shows the relationship of these parcels to two of the mapped hazards. This information is provided so that planners can ensure that development proposals comply with flood plain zoning and that careful attention is paid to drainage issues.

Table 9: Relationship of Potential Development to Hazard Areas

Parcel	**Landslide risk**	**Flood Zone**
River Club	Moderate Susceptibility	No
Clapp Road	Low	No
Holly Crest	Low	No
Wickham Pines	Low	No
Proving Grounds	Low	3.6994% in AE
Area off of 3A	Low	No
Deer Common	Low	No
First Parish Road	Low	25.7342% in A
Tilden Woods	Low	No

Maritime Education Center	Low	14.7016% in AE
Glades Estate	Moderate Susceptibility	106.4207% in AE
Indian Trail	Moderate Susceptibility	0.1365% in AE

Critical Infrastructure in Hazard Areas

Critical infrastructure includes facilities that are important for disaster response and evacuation (such as emergency operations centers, fire stations, water pump stations, etc.) and facilities where additional assistance might be needed during an emergency (such as nursing homes, elderly housing, day care centers, etc.). These facilities are listed in Table 10 and are shown on all of the maps in Appendix B.

The purpose of mapping the natural hazards and critical infrastructure is to present an overview of hazards in the community and how they relate to critical infrastructure, to better understand which facilities may be vulnerable to particular natural hazards.

Explanation of Columns in Table 10.

Column 1: ID #: The first column in Table 10 is an ID number which appears on the maps that are part of this plan. See Appendix B.

Column 2: Name: The second column is the name of the site. If no name appears in this column, this information was not provided to MAPC by the community.

Column 3: Type: The third column indicates what type of site it is.

Column 4: Landslide Risk: The fourth column indicates the degree of landslide risk for that site. This information came from NESEC. The landslide information shows areas with either a low susceptibility or a moderate susceptibility to landslides based on mapping of geological formations. This mapping is highly general in nature. For more information on how landslide susceptibility was mapped, refer to http://pubs.usgs.gov/pp/p1183/pp1183.html.

Column 5: FEMA Flood Zone: The fifth column addresses the risk of flooding. A "No" entry in this column means that the site is not within any of the mapped risk zones on the Flood Insurance Rate Maps (FIRM maps). If there is an entry in this column, it indicates the type of flood zone as follows:

Column 6: Locally-Identified Flood Area: The locally identified areas of flooding were identified by town staff as areas where flooding occurs. These areas do not necessarily coincide with the flood zones from the FIRM maps. They may be areas that flood due to inadequate drainage systems or other local conditions rather than location within a flood zone. The numbers correspond to the numbers on Map 8, "Hazard Areas".

Table 10: Relationship of Critical Infrastructure to Hazard Areas					
ID	**NAME**	**TYPE**	**Landslide Risk**	**FEMA Flood Zone**	**Locally-Identified Flood Area**
1	US Post Office	Post Office	Moderate Susceptibility	AO	Glades Road / Minot Beach
2	Hatherly School	School	Low Susceptibility	No	No
3	Lincoln Park Elderly Housing	Elderly Housing	Low Susceptibility	No	No
4	Community Residence	Elderly Housing	Low Susceptibility	No	No
5	Wampatuck Elementary School	School	Low Susceptibility	No	No
6	Cushing Elementary School	School	Low Susceptibility	No	No
7	Fire Dept.	Fire Department	Low Susceptibility	No	No
8	Fire Dept.	Fire Department	Low Susceptibility	AE	Humarock
10	US Post Office	Post Office	Low Susceptibility	No	No
11	Central Park Housing	Senior Housing	Low Susceptibility	No	No
12	Bell Atlantic	Telephone Exchange	Low Susceptibility	No	No
13	Wheeler Park 2	Elderly Housing	Low Susceptibility	No	No
14	Scituate Town Hall	Municipal Building	Low Susceptibility	No	No
18	Wheeler Park I	Elderly Housing	Low Susceptibility	No	No
19	Meeting House Estates	Senior Housing	Low Susceptibility	No	No
20	Environmental Police	Environmental Police	Low Susceptibility	No	No

Table 10: Relationship of Critical Infrastructure to Hazard Areas					
ID	**NAME**	**TYPE**	**Landslide Risk**	**FEMA Flood Zone**	**Locally-Identified Flood Area**
21	Scituate High School	School	Low Susceptibility	No	No
22	Police Dept.	Police Department	Low Susceptibility	No	No
23	Community Residence	Elderly Housing	Low Susceptibility	No	No
24	Fire Dept.	Fire Department	Low Susceptibility	No	No
25	Us Post Office	Post Office	Low Susceptibility	No	No
26	Cardigan Nursing Home	Elderly Housing	Low Susceptibility	No	No
27	Driftway Medical Center	Medical Facility	Low Susceptibility	No	No
28	Us Post Office	Post Office	Low Susceptibility	No	No
29	North River Waste Water Pollution Control Plant	Waste Water Treatment	Low Susceptibility	No	No
31	Montessori Community	School	Low Susceptibility	No	No
32	Heliport	Heliport	Low Susceptibility	No	No
33	North Scituate Sub Station	Sub Station	Low Susceptibility	No	No
35	Scituate Sub Station	Sub Station	Low Susceptibility	No	No
36	Scituate Water Treatment Plant	Water Treatment Plan	Low Susceptibility	No	No
37	Life Care Center	Elderly Housing	Low Susceptibility	No	No

Table 10: Relationship of Critical Infrastructure to Hazard Areas					
ID	**NAME**	**TYPE**	**Landslide Risk**	**FEMA Flood Zone**	**Locally-Identified Flood Area**
40	Jenkins Elementary School	School	Low Susceptibility	No	No
41	Senior Center	Nursing Home	Low Susceptibility	No	No
45	DPW Garage	DPW	Low Susceptibility	No	No
46	Scituate Public Library	Library	Low Susceptibility	No	No
47	Harbor Master	Harbor Master	Low Susceptibility	AE	Scituate Harbor
48	Coast Guard	Coast Guard	Low Susceptibility	AE	Scituate Harbor
49	Anderson Fuel	Fuel Depot	Low Susceptibility	No	No
50	Stand Pipe	Stand Pipe	Low Susceptibility	No	No
51	Fitts Mill	Fuel Depot	Low Susceptibility	No	No
53	Cell Towers	Cell Tower	Low Susceptibility	No	No
54	North River Bridge	Bridge	No	AE	No
55	Town Pier	Pier	Low Susceptibility	AE	No
56	Village Market	Super Market	Low Susceptibility	No	No
57	CVS	Pharmacy	Low Susceptibility	AE	Scituate Harbor
58	Scituate Pharmacy	Pharmacy	Low Susceptibility	No	No
59	Cudworth Cemetery	Cemetery	Low Susceptibility	No	No

Table 10: Relationship of Critical Infrastructure to Hazard Areas					
ID	**NAME**	**TYPE**	**Landslide Risk**	**FEMA Flood Zone**	**Locally-Identified Flood Area**
60	Fairview Cemetery	Cemetery	Low Susceptibility	No	No
61	Union Cemetery	Cemetery	Low Susceptibility	No	No
62	Old St Mary's Cemetery	Cemetery	Low Susceptibility	No	No
63	Herring Brook Reservoir Dam	Dam	Low Susceptibility	AE	No
64	Hunters Pond Dam	Dam	Moderate Susceptibility	AE	No
65	Scituate Harbor Yacht Club	Yacht Club	Low Susceptibility	AE	No
66	Satuit Boat Club	Boat Club	Low Susceptibility	AE	No
67	State Launch Ramp	Launch Ramp	Low Susceptibility	VE	No
68	Scituate Harbor Marina	Marina	No	VE	No
69	Satuit Water Front Club	Marina	Low Susceptibility	VE	No
70	Cole Park Way Lanching Ramp	Boat Launch	Low Susceptibility	AE	Scituate Harbor
71	Driftway Park LAunching Ramp	Boat Launch	No	AE	No
72	North River Marina	Marina	Low Susceptibility	AE	No
73	MBTA Greenbush Layover Station	Transportation Facility	Low Susceptibility	No	No
74	St Mary's Church	Church	Low Susceptibility	No	No

Table 10: Relationship of Critical Infrastructure to Hazard Areas					
ID	**NAME**	**TYPE**	**Landslide Risk**	**FEMA Flood Zone**	**Locally-Identified Flood Area**
75	St Mary's Hall	Church Hall	Low Susceptibility	AE	No
76	Satuit Hardware Store	Hardware Store	Low Susceptibility	AE	Scituate Harbor
77	Scituate Animal Shelter	Animal Shelter	Low Susceptibility	No	No
78	Driftway Animal Hospital	Animal Shelter	Low Susceptibility	No	No
79	Francis R. Powers Bridge	Bridge	Low Susceptibility	AE	Humarock
80	Sea St. Bridge	Bridge	Low Susceptibility	AE	Humarock
81	Cell Towers	Cell Tower	Low Susceptibility	No	No
82	Cell Towers	Cell Tower	Low Susceptibility	No	No
83	Cell Towers	Cell Tower	Low Susceptibility	No	No
84	Mount Hope Cemetery	Cemetery	Low Susceptibility	No	No
85	Groveland Cemetery	Cemetery	Low Susceptibility	No	No
86	Harbor United Methodist Church	Church	Low Susceptibility	No	No
87	First Parish Unitarian Church	Church	Low Susceptibility	No	No
88	First Baptist Church	Church	Low Susceptibility	No	No
89	First Trinitarian Congregational Church	Church	Low Susceptibility	No	No

Table 10: Relationship of Critical Infrastructure to Hazard Areas					
ID	**NAME**	**TYPE**	**Landslide Risk**	**FEMA Flood Zone**	**Locally-Identified Flood Area**
90	Christ Lutheran Church	Church	Low Susceptibility	No	No
91	Saint Francis Cabrini Church	Church	Low Susceptibility	No	No
92	Union Chapel	Church	Low Susceptibility	No	No
93	Scituate Reservoir	Drinking Water Reservoir	Low Susceptibility	AE	No
94	Lawson Tower	Historic Site	Low Susceptibility	No	No
95	Scituate Lighthouse	Historic Site	Low Susceptibility	VE	Oceanside Drive & Lighthouse Point
97	GAR Hall	Historic Site	Low Susceptibility	No	No
98	Maritime Mossing Museum	Historic Site	Low Susceptibility	No	No
99	Little Red School House	Historic Site	Low Susceptibility	No	No
100	Stockbridge Mill	Historic Site	Low Susceptibility	No	No
101	Mann Farmhouse	Historic Site	Low Susceptibility	No	No
102	Old Oaken Bucket Homestead	Historic Site	Low Susceptibility	No	No
103	Cudworth House & Barn	Historic Site	Low Susceptibility	No	No
104	Boat Launch	Boat Launch	Low Susceptibility	AE	Humarock
105	Scituate Marine Park	Municipal Building & Marina	Low Susceptibility	AE	Scituate Harbor

Table 10: Relationship of Critical Infrastructure to Hazard Areas					
ID	**NAME**	**TYPE**	**Landslide Risk**	**FEMA Flood Zone**	**Locally-Identified Flood Area**
106	Driftway Medical Center	Medical Facility	Low Susceptibility	No	No
107	Jacob Hatch Building	Medical Facility	Low Susceptibility	No	No
108	Pier 44 (Town-owned)	Municipal Building	No	VE	No
109	Ellis House	Municipal Building	Low Susceptibility	No	No
110	Well #10	Public Drinking Water Well	Low Susceptibility	AE	No
111	Well #11	Public Drinking Water Well	Low Susceptibility	AE	No
112	Well #19	Public Drinking Water Well	Low Susceptibility	No	No
113	Well #17A	Public Drinking Water Well	Low Susceptibility	No	No
114	Well #22	Public Drinking Water Well	Low Susceptibility	No	No
115	Chain Pond Pump Station	Sewer Pump Station	Low Susceptibility	AE	No
116	Sand Hills Pump Station	Sewer Pump Station	Low Susceptibility	AE	Oceanside Drive & Lighthouse Point
117	First Parish Pump Station	Sewer Pump Station	Low Susceptibility	No	No
118	Country Way Pump Station	Sewer Pump Station	Low Susceptibility	No	No
119	Herring Brook Pump Station	Sewer Pump Station	Low Susceptibility	No	No
120	Collier Road Pump Station	Sewer Pump Station	Low Susceptibility	No	No
121	Peggotty Beach Pump Station	Sewer Pump Station	Low Susceptibility	AE	No

Table 10: Relationship of Critical Infrastructure to Hazard Areas					
ID	**NAME**	**TYPE**	**Landslide Risk**	**FEMA Flood Zone**	**Locally-Identified Flood Area**
122	First Cliff Pump Station	Sewer Pump Station	Low Susceptibility	AE	No
123	Transfer Station	Solid Waste Transfer Station	Low Susceptibility	No	No
124	Community Residence	Special Needs	Low Susceptibility	No	No
125	Pincin Hill Standpipe	Stand Pipe	Low Susceptibility	No	No
126	Walnut Hill Booster Pump Station	Water Booster Pump Station	Low Susceptibility	No	No
127	Wind Turbine	Wind Turbine	Low Susceptibility	0.2 PCT ANNUAL CHANCE FLOOD HAZARD	No
128	Seawalls	Seawalls	Low Susceptibility	VE	Surfside Road
129	MBTA North Scituate Station	Transportation Facility	Low Susceptibility	No	No
130	MBTA Commuter rail tracks	Commuter Rail Tracks	Low Susceptibility	No	No
131	Well 18B	Public Drinking Water Well	Low Susceptibility	No	No
132	Water Dept. Business Office	Municipal Building	Low Susceptibility	No	No
133	Mann Lot Booster Station	Water Booster Pump Station	Low Susceptibility	No	No
134	Humarock Post Office	Post Office	Low Susceptibility	AO	Humarock
135	Village at South River Marina	Marina	Low Susceptibility	AE	Humarock
136	Gates Jr. High School	School	Low Susceptibility	No	No

Vulnerability Assessment

The purpose of the vulnerability assessment is to estimate the extent of potential damages from natural hazards of varying types and intensities. A vulnerability assessment and estimation of damages was performed for hurricanes, earthquakes, and flooding. The methodology used for hurricanes and earthquakes was the HAZUS-MH software. The methodology for flooding was developed specifically to address the issue in many of the communities where flooding was not solely related to location within a floodplain.

Introduction to HAZUS-MH

HAZUS- MH (multiple-hazards) is a computer program developed by FEMA to estimate losses due to a variety of natural hazards. The following overview of HAZUS-MH is taken from the FEMA website. For more information on the HAZUS-MH software, go to http://www.fema.gov/plan/prevent/hazus/index.shtm

> "HAZUS-MH is a nationally applicable standardized methodology and software program that contains models for estimating potential losses from earthquakes, floods, and hurricane winds. HAZUS-MH was developed by the Federal Emergency Management Agency (FEMA) under contract with the National Institute of Building Sciences (NIBS). Loss estimates produced by HAZUS-MH are based on current scientific and engineering knowledge of the effects of hurricane winds, floods and earthquakes. Estimating losses is essential to decision-making at all levels of government, providing a basis for developing and evaluating mitigation plans and policies as well as emergency preparedness, response and recovery planning.
>
> HAZUS-MH uses state-of-the-art geographic information system (GIS) software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of hurricane winds, floods and earthquakes on populations."

There are three modules included with the HAZUS-MH software: hurricane wind, flooding, and earthquakes. There are also three levels at which HAZUS-MH can be run. Level 1 uses national baseline data and is the quickest way to begin the risk assessment process. The analysis that follows was completed using Level 1 data.

Level 1 relies upon default data on building types, utilities, transportation, etc. from national databases as well as census data. While the databases include a wealth of information on the Town of Scituate, it does not capture all relevant information. In fact, the HAZUS training manual notes that the default data is "subject to a great deal of uncertainty."

However, for the purposes of this plan, the analysis is useful. This plan is attempting to only generally indicate the possible extent of damages due to certain types of natural disasters and to allow for a comparison between different types of disasters. Therefore,

this analysis should be considered to be a starting point for understanding potential damages from the hazards. If interested, communities can build a more accurate database and further test disaster scenarios.

Estimated Damages from Hurricanes

The HAZUS software was used to model potential damages to the community from a 100 year and 500 year hurricane event; storms that are .01% and .005% likely to happen in a given year and roughly equivalent to a Category 2 and Category 4 hurricane. The damages caused by these hypothetical storms were modeled as if the storm track passed directly through the Town, bringing the strongest winds and greatest damage potential.

Though there are no recorded instances of a hurricane equivalent to a 500 year storm passing through Massachusetts, this model was included in order to present a reasonable "worst case scenario" that would help planners and emergency personnel evaluate the impacts of storms that might be more likely in the future, as we enter into a period of more intense and frequent storms.

Table 11
Estimated Damages from Hurricanes

	100 Year	**500 Year**
Building Characteristics		
Estimated total number of buildings	7,249	7,249
Estimated total building replacement value (Year 2002 $) (Millions of Dollars)	$1,905	$1,905
Building Damages		
# of buildings sustaining minor damage	1,264	2,693
# of buildings sustaining moderate damage	189	1,243
# of buildings sustaining severe damage	10	335
# of buildings destroyed	12	286
Population Needs		
# of households displaced	22	435
# of people seeking public shelter	5	88
Debris		
Building debris generated (tons)	3,392.42	24,440.72
Tree debris generated (tons)	8,305.58	28,691.28
# of truckloads to clear building debris	136	971
Value of Damages (Thousands of dollars)		
Total property damage	$28,572.64	$261,085.87
Total losses due to business interruption	$2,845.39	$32,603.27

Estimated Damages from Earthquakes

The HAZUS earthquake module allows users to define an earthquake magnitude and model the potential damages caused by that earthquake as if its epicenter had been at the geographic center of the study area. For the purposes of this plan, two earthquakes were selected: magnitude 5.0 and a magnitude 7.0. Historically, major earthquakes are rare in New England, though a magnitude 5 event occurred in 1963.

Table 12
Estimated Damages from Earthquakes

	Magnitude 5.0	**Magnitude 7.0**
Building Characteristics		
Estimated total number of buildings	7,249	7,249
Estimated total building replacement value (Year 2002 $)(Millions of dollars)	$1,905	$1,905
Building Damages		
# of buildings sustaining slight damage	1,140	996
# of buildings sustaining moderate damage	298	2,808
# of buildings sustaining extensive damage	36	2,064
# of buildings completely damaged	4	1,218
Population Needs		
# of households displaced	13	1,358
# of people seeking public shelter	2	265
Debris		
Building debris generated (tons)	Not available	Not available
Value of Damages (Millions of dollars)		
Total property damage	$86.51	$1,064.44
Total losses due to business interruption	$3.06	$86.04

Estimated Damages from Flooding

MAPC did not use HAZUS-MH to estimate flood damages in Scituate. In addition to technical difficulties with the software, the riverine module is not a reliable indicator of flooding in areas where inadequate drainage systems contribute to flooding even when

those structures are not within a mapped flood zone. In lieu of using HAZUS, MAPC developed a methodology to give a rough approximation of flood damages.

Scituate is 17.32 square miles or *11,083.75* acres. Approximately 1,014.96 acres have been identified by local officials as areas of flooding. This amounts to 9.16 % of the land area in Scituate. The number of structures in each flood area was estimated by applying the percentage of the total land area to the number of structures (7,249) in Scituate; the same number of structures used by HAZUS for the hurricane and earthquake calculations. HAZUS uses a value of $262,767.14 per structure for the building replacement value. This was used to calculate the total building replacement value in each of the flood areas. The calculations were done for a low estimate of 10% building damages and a high estimate of 50% as suggested in the FEMA September 2002 publication, "State and Local Mitigation Planning how-to guides" (Page 4-13). The range of estimates for flood damages is *$17,447,958.82- $87,239,794.10*. These calculations are not based solely on location within the floodplain or a particular type of storm (i.e. 100 year flood).

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Table 13
Estimated Damages from Flooding

ID	Flood Hazard Area	Approximate Area in Acres	% of Total Land Area in Scituate	Estimated # of Structures	Replacement Value	Low Estimate of Damages	High Estimate of Damages
1	Glades Road / Minot Beach	29.56	.27	19.57	$5,142,957.29	$514,295.73	$2,571,478.65
2	Surfside Road	47.72	.43	31.17	$8,190,635.69	$819,063.57	$4,095,317.85
3	Oceanside Drive & Lighthouse Point	257.46	2.32	168.18	$44,191,336.75	$4,419,133.68	$22,095,668.38
4	Peggotty Beach	111.78	1.01	73.21	$19,238,469.88	$1,923,846.99	$9,619,234.94
5	Humarock	413.89	3.73	270.39	$71,049,002.62	$7,104,900.26	$35,524,501.31
6	Maple Avenue	19.17	.17	12.32	$3,238,158.30	$323,815.83	$1,619,079.15

Table 13
Estimated Damages from Flooding

ID	Flood Hazard Area	Approximate Area in Acres	% of Total Land Area in Scituate	Estimated # of Structures	Replacement Value	Low Estimate of Damages	High Estimate of Damages
7	First Parish Road	9.9	.09	6.52	$1,714,319.10	$171,431.91	$857,159.55
8	Glades Estate	14.04	.13	9.42	$2,476,238.70	$247,623.87	$1,238,119.35
9	Gannett Road	9.09	.08	5.8	$1,523,839.20	$152,383.92	$761,919.60
10	Scituate Harbor	81.41	.73	52.92	$13,905,032.68	$1,390,503.27	$6,952,516.34
11	Chief Justice Cushing Highway	1.68	.02	1.45	$380,959.80	$38,095.98	$190,479.90
12	Buttonwood Lane & Bayberry	19.27	.17	12.32	$3,238,158.30	$323,815.83	$1,619,079.15

Table 13
Estimated Damages from Flooding

ID	Flood Hazard Area	Approximate Area in Acres	% of Total Land Area in Scituate	Estimated # of Structures	Replacement Value	Low Estimate of Damages	High Estimate of Damages
Totals		***1,014.96***	***9.16***	***664***	***$174,479,588.20***	***$17,447,958.82***	***$87,239,794.10***

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V. HAZARD MITIGATION GOALS

The Scituate Local Multiple Hazard Community Planning Team met on September 14, 2010. At that meeting, the team reviewed and discussed the goals from the 2005 Hazard Mitigation Plan for the Town of Scituate. After some discussion, the existing goals were found to still be reflective of the Town's objectives with regard to addressing hazard mitigation in the community.

The following ten goals were endorsed by the Committee for the 2010 update of the Scituate Hazard Mitigation Plan:

1. Ensure that critical infrastructure sites are protected from natural hazards.

2. Protect existing residential and business areas from flooding.

3. Maintain existing mitigation infrastructure in good condition.

4. Continue to enforce existing zoning and building regulations.

5. Educate the public about zoning and building regulations, particularly with regard to changes in regulations that may affect tear-downs and new construction.

6. Work with surrounding communities to ensure regional cooperation and solutions for hazards affecting multiple communities.

7. Encourage future development in areas that are not prone to natural hazards.

8. Educate the public about natural hazards and mitigation measures.

9. Make efficient use of public funds for hazard mitigation.

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VI. EXISTING MITIGATION MEASURES

Existing Multi-Hazard Mitigation Measures

Comprehensive Emergency Management Plan (CEMP) – Every community in Massachusetts is required to have a Comprehensive Emergency Management Plan. These plans address mitigation, preparedness, response and recovery from a variety of natural and man-made emergencies. These plans contain important information regarding flooding, hurricanes, tornadoes, dam failures, earthquakes, and winter storms. Therefore, the CEMP is a mitigation measure that is relevant to all of the hazards discussed in this plan.

Communications Equipment – Scituate has full coverage of the Town with emergency services radio and reverse 911 capabilities for distribution of emergency messages. Incident command units are available through Plymouth County and MEMA.

Emergency Power Generators – The Town maintains emergency power generators in several important public facilities and emergency shelters.

Massachusetts State Building Code – The Massachusetts State Building Code contains many detailed regulations regarding wind loads, earthquake resistant design, flood-proofing, and snow loads.

Local Emergency Management Planning Committee (LEPC) – The fire chief leads the LEPC, which meets on an as-needed basis. The Town also participates in a Plymouth County Fire Chiefs monthly meeting.

Existing Flood Hazard Mitigation Measures

National Flood Insurance Program (NFIP) – Scituate participates in the NFIP with 1,445 policies in force as of the May 31, 2010. FEMA maintains a database on flood insurance policies and claims. This database can be found on the FEMA website at http://www.fema.gov/business/nfip/statistics/pcstat.shtm

The following information is provided for the Town of Scituate:

Flood insurance policies in force (as of May 31, 2010)	1,445
Coverage amount of flood insurance policies	$356,200,900
Premiums paid	$1,823,192
Total losses (all losses submitted regardless of the status)	3,099
Closed losses (Losses that have been paid)	2,767
Open losses (Losses that have not been paid in full)	4
CWOP losses (Losses that have been closed without payment)	328
Total payments (Total amount paid on losses)	$49,777,089.85

The Town complies with the NFIP by enforcing floodplain regulations, maintaining up-to-date floodplain maps, and providing information to property owners and builders regarding floodplains and building requirements.

Since the 2005 plan, the policies in force have increased by 61 and the total losses have increased by 160. The total payments, as of December 21, 2004, were $47,745,006.26, approximately $2 million less than the most recent figure.

CRS Program Participation – The Town of Scituate participates in the Community Rating System (CRS) program, gaining a reduction in flood insurance rates for property owners in the Town in exchange for mitigation actions taken to reduce the Town's potential vulnerability to flooding. The program functions on a rating system, with an individual community's rating being based on the number of points they receive, with points allocated for each flood mitigation measure enacted. The Town of Scituate currently has a rating of Class 8, resulting in a 10% reduction in flood insurance rates in the Town.

Public Works Operations/Maintenance Activities – The Public Works Department actively maintains the Town's storm drain system. The following specific activities serve to maintain the capability of the drainage system through the reduction of sediment and litter build up and proper maintenance and repair.

- *Street sweeping* – All streets are swept once annually.
- *Catch basin cleaning* – All are cleaned at least once annually.
- *Roadway treatments* – Streets are treated with a mix of sand, salt, and liquid brine applicator.

Town of Scituate Master Plan – The Scituate Master Plan was adopted in 2004. While it is much broader-based and focuses on all aspects of development in the Town, issues that touch on flooding and hazard mitigation can be found throughout the plan. The plan focuses more on policies and strategies than on detailed recommendations.

Flood Mitigation Action Plan – The 2001 Flood Mitigation Action Plan presents a detailed analysis of flooding conditions in Scituate and a set of recommendations for mitigating the impacts of flooding on the Town.

Conservation/Recreation Open Space Plan – The Town of Scituate Open Space and Recreation Plan was developed in 2008. The plan identified a number of open space parcels prioritized for acquisition that would also benefit hazard mitigation efforts.

Floodplain Zoning District – Zoning is intended to protect the public health and safety through the regulation of land use. The Scituate Zoning Bylaw includes a Flood Plain and Watershed Protection District (Section 470). The purposes of this district are:

1. To protect the health and safety of persons against those hazards, which may result from unsuitable development in marshes, bogs and lowlands, or along ponds or watercourses, or in areas subject to flooding.
2. To conserve the values of lands and buildings in such flood-prone areas.
3. To facilitate the adequate protection of the community water supply through preservation and maintenance of the ground water table.
4. To protect and preserve the inland marshes, bogs, ponds, and watercourses and their adjoining wetland soils in order to safeguard the purity of inland and coastal waters and for the protection and propagation of the food chain supportive of marine life.
5. To encourage the most appropriate and suitable use of the land.
6. To preserve and increase the amenities of the town.

The Floodplain District is an overlay district, covering an area shown on the map entitles "Town of Scituate, Massachusetts, Flood Plain and Watershed Protection District, 1972" and kept on file in the Town Engineer's Office. Within the District, no new residential or commercial structures may be built and existing structures may only be modified by special permit requiring compliance with the National Flood Insurance Program and the Massachusetts State Building Code. The district predates the Federal Flood Insurance Rate Map (FIRM) of the Town, so the boundaries do not coincide with the FIRM Zone A. The regulations for this district equal or exceed the requirements of FEMA.

Subdivision Rules and Regulations - The Scituate Subdivision Rules and Regulations contains provisions that serve to reduce the impacts of floods and erosion. Through its design and layout standards, the regulations contribute to the Town's overall efforts to mitigate the risks for damage through flooding.

Stormwater Bylaw – The purpose of the Stormwater Bylaw (section 32050) is in part to mitigate flooding through site design and structural improvements that promote the infiltration of stormwater on site or otherwise retain stormwater in areas of new development where there is a significant increase in impervious surfaces and/or a change in drainage patterns.

Wetlands Protection By-Law – The purpose of the Wetlands Protection By-Law (Article 30700) is to further protect the Town's shores, ponds, rivers, and wetlands for, among other reasons, flood control, erosion and sedimentation control, and public safety. The by-law requires review of all development, excavation, or fill activities in or within 100 feet of any wetland, shoreline, coastal feature, etc and also any land subject to tidal action, coastal storm flowage, or flooding.

Salt Marsh and Tidelands Conservation District – The Salt Marsh and Tidelands zoning district (section 460) restricts development so as to protect the natural character of salt marsh and tidelands areas in the Town.

DCR dam safety regulations – The state has enacted dam safety regulations mandating inspections and emergency action plans. All new dams are subject to state permitting.

Elevating Repetitive Loss Properties - The Town has an active elevation grant program for residents to elevate their homes or utilities that has served more than 50 property owners since 1997. This program uses grant funding from FEMA, utilizing the Flood Mitigation Assistance, Hazard Mitigation, and Severe Repetitive Loss grant programs.

Seawalls, Jetties, and Dikes – Portions of the Town of Scituate coastline is protected by a series of seawalls, jetties and dikes, which are in need of continued monitoring and maintenance.

Public Education – The Town's Community Rating System Coordinator conducts annual flood awareness meetings as well as distributing information on the hazards presented by flooding in the Town through print and web resources.

Existing Wind Hazard Mitigation Measures

Massachusetts State Building Code – The town enforces the Massachusetts State Building Code whose provisions are generally adequate to protect against most wind damage. The code's provisions are the most cost-effective mitigation measure against tornados given the extremely low probability of occurrence. If a tornado were to occur, the potential for severe damages would be extremely high.

Tree-trimming program – The Town conducts its own tree maintenance and also uses its own equipment to trim and remove trees as needed.

Existing Winter Hazard Mitigation Measures

Snow disposal –The town conducts general snow removal operations with its own equipment. Where necessary, snow is removed and dumped on other City properties.

Existing Brush Fire Hazard Mitigation Measures

Burn Permits – The Town fire department requires a written permit for outdoor burning, which includes explanation of the related regulations and precautions for the permit-holder to take. The permit-holder must call the fire department on the proposed burn day to confirm weather conditions are suitable for outdoor burning and receive verbal permission to proceed.

Subdivision/Development Review – The Fire Department participates in the review of new subdivisions and development projects.

Existing Geologic Hazard Mitigation Measures

Massachusetts State Building Code – The State Building Code contains a section on designing for earthquake loads (780 CMR 1612.0). Section 1612.1 states that the purpose of these provisions is "to minimize the hazard to life to occupants of all buildings

and non-building structures, to increase the expected performance of higher occupancy structures as compared to ordinary structures, and to improve the capability of essential facilities to function during and after an earthquake". This section goes on to state that due to the complexity of seismic design, the criteria presented are the minimum considered to be "prudent and economically justified" for the protection of life safety. The code also states that absolute safety and prevention of damage, even in an earthquake event with a reasonable probability of occurrence, cannot be achieved economically for most buildings.

Section 1612.2.5 sets up seismic hazard exposure groups and assigns all buildings to one of these groups according to a Table 1612.2.5. Group II includes buildings which have a substantial public hazard due to occupancy or use and Group III are those buildings having essential facilities which are required for post-earthquake recovery, including fire, rescue and police stations, emergency rooms, power-generating facilities, and communications facilities.

Table 14- Scituate Existing Mitigation Measures			
Type of Existing Mitigation Measures	**Area Covered**	**Effectiveness/ Enforcement**	**Improvements/ Changes Needed**
MULTIPLE HAZARDS			
Comprehensive Emergency Management Plan (CEMP)	Town-wide.	Emphasis is on emergency response.	None.
Communications Equipment	Town-wide.	Effective	None.
Massachusetts State Building Code	Town-wide.	Effective for new construction.	None.
Emergency Power Generators	Town-wide.	Effective.	Upgrade generators as needed; provide generators at additional locations; provide alternative fuel sources and generator power source flexibility.
Participation in the Local Emergency Planning Committee (LEPC)	Town-wide.	A forum for inter-departmental cooperation on natural and manmade disasters.	None.
FLOOD HAZARDS			
Participation in the National Flood Insurance Program (NFIP)	Areas identified on the FIRM maps.	There are 1,445 policies in force.	Encourage all eligible homeowners to obtain insurance.
CRS Program Participation	Town-wide	Class 8	Seek more CRS points.
Public Works Operations/Maintenance Activities	Town-wide.	Effective.	None.
Master Plan	Town-wide	Effective	Incorporate hazard mitigation and sea level rise into future updates.
Floodplain Management Plan	Town-wide	Effective.	None.
Open Space Plan	Town-wide	Effective.	None
Zoning – Floodplain District	Town-wide.	Effective for new construction.	None.

Table 14- Scituate Existing Mitigation Measures			
Type of Existing Mitigation Measures	**Area Covered**	**Effectiveness/ Enforcement**	**Improvements/ Changes Needed**
Subdividision Rules & Regulations	Town-wide	Effective for new construction.	None.
Stormwater By-Law	Town-wide	Effective.	None.
Wetlands Protection By-Law	Resource Areas	Effective.	None.
Salt Marsh & Tidelands Conservation District	Resource Areas	Effective.	None.
DCR Dam Safety Regulations	Dams	Effective.	None.
Elevating Repetitive Loss Properties	Repetitive Loss Properties	Effective.	Continue to seek funding.
Seawalls, Jetties, and Dikes	Coastline	Somewhat effective.	Continue to monitor and repair.
Public Education	Town-wide	Effective.	None.
WIND HAZARDS			
The Massachusetts State Building Code	Town-wide.	Effective for most situations except severe storms	None.
Tree trimming program	Town-wide.	Satisfactory.	None.
WINTER HAZARDS			
Snow Disposal Site	As necessary	Satisfactory.	None.
BRUSH FIRE HAZARDS			
Burn Permit	Town-wide.	Effective.	None.
Development Review	Town-wide.	Effective.	None.
GEOLOGIC HAZARDS			
The Massachusetts State Building Code	Town-wide.	Effective	None.

VII. MITIGATION MEASURES FROM THE 2005 PLAN

Review and Update Process

At a meeting of the Scituate Hazard Mitigation Committee, Town staff reviewed the mitigation measures identified in the 2005 South Shore Regional Pre-Disaster Mitigation Plan Scituate Annex and determined whether each measure had been implemented or deferred. For implemented projects, they were categorized as either complete or in-process, with the latter referring to projects begun but not yet completed. In process measures are carried forward into the 2011 Scituate Hazard Mitigation Plan. Of those measures that had been deferred, the committee evaluated whether the measure should be deleted or carried forward into the 2010 Scituate Hazard Mitigation Plan. The decision on whether to delete or retain a particular measure was based on the committee's assessment of the continued relevance or effectiveness of the measure and whether the deferral of action on the measure was due to the inability of the Town to take action on the measure.

Table 15
Mitigation Measures from the 2005 Plan

Mitigation Measures	Priority	Implementation Responsibility	2011 Status
Develop system of coordination and prioritization of Hazard Mitigation efforts by Town departments to update Flood Hazard Mitigation Plan and PDM Natural Hazards Plan	High	Department Heads	In-Process
Continue with GIS mapping activities for preparation of Flood Hazards Plan	High	CRS Staff	In-Process
Reconstruct Culverts on Oceanside Drive and behind Turners Road	High	DPW	Complete
Elevate and enhance drainage and/or flood prevention structures for key intersections as specified on the flood mitigation map	High	DPW	In-Process

Table 15
Mitigation Measures from the 2005 Plan

Mitigation Measures	Priority	Implementation Responsibility	2011 Status
Encourage buy-outs of high hazard areas, develop criteria for properties to be purchased or relocated	High	CRS Staff	In-Process
Repair seawalls & revetments as recommended in Town's 5 year capital plan	High	DPW, Finance Committee, Selectmen	In-Process
Develop a benchmark system of elevation points on NGVD datum throughout Town	High	CRS Coordinator	Complete
Culvert Cleaning & Maintenance in several neighborhoods	High	DPW	In-Process
Develop a public education program about flood prevention and flood insurance; continue active participation in Community Rating System Program	High	CRS Coordinator	In-Process
Key Town employees should participate in FEMA training in Emmetsburg, MD or other locations where available	Medium	DPW	Deferred
Public education for property owners in the high wildfire risk areas about maintaining setback from homes to the edge of brush	Medium	Fire Department	Delete (No high risk fire areas identified)
Implement the Memorandum of Agreement for Building Department Mutual	Medium	Building Inspector; Town Administrator and Board of Selectmen	Deferred

Table 15
Mitigation Measures from the 2005 Plan

Mitigation Measures	Priority	Implementation Responsibility	2011 Status
Aide among Scituate and six neighboring Towns			
The issue of how to control, cut, or eradicate Phragmites should be investigated.	Low	Conservation Commission	In-Process

VIII. HAZARD MITIGATION STRATEGY

What is Hazard Mitigation?

Hazard mitigation means to permanently reduce or alleviate the losses of life, injuries and property resulting from natural hazards through long-term strategies. These long-term strategies include planning, policy changes, education programs, infrastructure projects and other activities. FEMA currently has three mitigation grant programs: the Hazards Mitigation Grant Program (HGMP), the Pre-Disaster Mitigation program (PDM), and the Flood Mitigation Assistance (FMA) program. The three links below provide additional information on these programs.

http://www.fema.gov/government/grant/hmgp/index.shtm

http://www.fema.gov/government/grant/pdm/index.shtm

http://www.fema.gov/government/grant/fma/index.shtm

Hazard Mitigation Measures can generally be sorted into the following groups:

- Prevention: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.
- Property Protection: Actions that involve the modification of existing buildings or infrastructure to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, and shatter resistant glass.
- Public Education & Awareness: Actions to inform and educate citizens, elected officials, and property owners about the potential risks from hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- Natural Resource Protection: Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- Structural Projects: Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include storm water controls (e.g., culverts), floodwalls, seawalls, retaining walls, and safe rooms.
- Emergency Services Protection: Actions that will protect emergency services before, during, and immediately after an occurrence. Examples of these actions

include protection of warning system capability, protection of critical facilities, protection of emergency response infrastructure.

(Source: *FEMA Local Multi-Hazard Mitigation Planning Guidance*)

Regional and Inter-Community Considerations

Some hazard mitigation issues are strictly local. The problem originates primarily within the municipality and can be solved at the municipal level. Other issues are inter-community issues that involve cooperation between two or more municipalities. There is a third level of mitigation which is regional; involving a state, regional, or federal agency or an issue that involves three or more municipalities.

Inter-Community Considerations

Shoreline Environment – The coastal shoreline of the South Shore area is a dynamic environment where forces of erosion and deposition of sand are constantly at work changing the beach profile. This process disregards municipal boundaries as sand and other materials are moved along the coast. Shoreline protection measures such as sea walls, jetties, and others have an impact on this process with the potential of building up sand in some areas while striping it away from others. Municipalities along the South Shore should work to understand how these processes are at work locally and consider mutually beneficial means of protecting their shore side communities from the impacts of storm damage.

Regional Issues

Climate Change and Sea Level Rise – The entirety of Massachusetts's coastal environment faces potential risk from Climate Change and associated sea level rise. Models incorporating current trends indicate a gradual rise in global temperature, with a consequent increase in the volume of water in the world's ocean due to thermal expansion as the water warms and the addition of water from melting ice sheets and glaciers. Projections for sea level rise by the end of this century range from four to 33 inches. Higher temperatures and higher sea levels will result in a greater frequency and intensity of storms and higher flood levels.

Attempts to mitigate climate change or adapt to its potential impacts are largely outside the scope of this Hazard Mitigation Plan, which relies primarily on historic trends to assess risk and vulnerability. The potential changes to the State's storm damage profile caused by Climate Change will be well outside of historic trends, making those trends uncertain predictors of future risk and vulnerability at best. Coastal Cities, Towns and Regional Planning Agencies will need to advocate for a statewide response that includes using the best available information to map and model climate change and sea level rise data related to coastal hazards in Massachusetts and disseminate this information for use in hazard mitigation planning and land use policy development.

Regional Partners - In many communities, mitigating natural hazards, particularly flooding, is more than a local issue. The drainage systems that serve these communities are a complex system of storm drains, roadway drainage structures, pump stations and other facilities owned and operated by a wide array of agencies including but not limited to the Town of Scituate, the Department of Conservation and Recreation (DCR), and Massachusetts Department of Transportation (MDOT). The planning, construction, operations, and maintenance of these structures are integral to the flood hazard mitigation efforts of communities. These agencies must be considered the communities regional partners in hazard mitigation. These agencies also operate under the same constraints as communities do, including budgetary and staffing constraints and numerous competing priorities. In the sections that follow, the plan includes recommendations for activities where cooperation with these other agencies may be necessary. Implementation of these recommendations will require that all parties work together to develop solutions.

Process for Setting Priorities for Mitigation Measures

The decisions on priorities were made at a meeting of the local committee. Priority setting was based on local knowledge of the hazard areas, including impacts of hazard events and the extent of the area impacted and the relation of a given mitigation measure to the Town's identified goals. In addition, MAPC asked the local committee to take into consideration factors such as the number of homes and businesses affected, whether or not road closures occurred and what impact closures had on delivery of emergency services and the local economy, anticipated project costs, whether the town currently had the technical and administrative capability to carry out the mitigation measures, whether any environmental constraints existed, and whether the town would be able to justify the costs relative to the anticipated benefits.

The listing of high, medium, and low potential mitigation measures is provided in the sections below and summarized in Table 16.

High Priority Mitigation Measures

Flooding, Drainage Infrastructure, and Dams

A) Elevate Repetitive Loss Structures: Continue to offer the grant program to assist floodplain property owners in elevating their homes and/or utilities. Consider efforts to target repetitive loss structures.

B) Hazard Mitigation Plan Coordination: Maintain and improve the coordination and prioritization of hazard mitigation efforts by Town departments to support implementation efforts and update of the Scituate Hazard Mitigation Plan. In this process, consider ways of maximizing CRS points, tracking implementation success, and public education efforts that link specific projects with the overall hazard mitigation goals and the benefits to the community.

C) GIS Flood Area Mapping: Continue with GIS mapping activities as related to preparation of Flood Hazard Plans.

D) Protect Key Road Intersections: Elevate and enhance drainage and/or flood prevention structures at key intersections, as specified on the flood mitigation map.

E) High Hazard Area Buy-Outs: Encourage buy-outs of high hazard areas; develop criteria for properties to be purchased or relocated.

F) Seawall Repairs: Repair seawalls & revetments as recommended in Town's 5 year capital plan. Create a strategy for annual predictable funding for on-going sea wall repair and maintenance. Establish a system for documentation of repair and maintenance activities. Seek opportunities to fund individual sea wall upgrade projects that will address the potential for rising sea levels and increased storm intensity. Utilize the Scituate Sea Wall Committee to help guide sea wall maintenance and investments.

G) Culvert Maintenance: Continue to implement a strategy to prioritize culvert cleaning and maintenance in areas with frequent flooding.

H) CRS Participation: Continue Active Participation in the Community Rating System program including regular public education events related to flood awareness and prevention as well as the availability of flood insurance through NFIP.

I) Peggotty Beach Management Plan: Working with a consultant, the Town has developed a detailed management plan for the Peggotty Beach area which includes a number of recommendations related to hazard mitigation efforts. These measures should be prioritized for implementation, subject to funding and permitting considerations, including private property acquisition to remove homes from the high hazard areas directly adjacent to the shoreline, repair and expansion of riprap, relocation of the roadway and utilities, improvements to the public parking lot, and other measures deemed necessary as study of this area continues.

Multi-hazard

J) Public Education: Continue active public education programs related to flood and hurricane awareness and mitigation measures. Work with the Scituate Coastal Coalition to disperse educational materials in the community and help organize attendance at information meetings. In proportion to the potential risk, consider creating educational information on other potential natural hazards impacting Scituate such as winter storms, tornadoes, and earthquakes.

K) Emergency Power Generators: Upgrade all generators as needed; provide alternative fuel sources and generator power source flexibility.

Measures to Ensure Compliance with NFIP

L) Floodplain Management: Continue to enforce the Floodplain Zoning District (Section 470) and associated building regulations for floodplain areas. Update this district to remain consistent with FEMA guidelines and floodplain mapping.

M) Floodplain Mapping: Maintain up to date maps of local FEMA identified floodplains.

N) Acquisition of Vacant Flood Prone Lands: Acquire priority open space parcels in floodplain areas in order to maintain flood storage and water infiltration capacity. These parcels may also be used for general conservation and recreation purposes.

Medium Priority Mitigation Measures

Flooding, Drainage Infrastructure and Dams

O) FEMA Training: Key town staff should participate in MEMA or FEMA trainings related to hazard mitigation planning and implementation.

P) Coastal Management Plan: Prepare a coastal management plan to include the maintenance, use and accessibility of all coastal resources of the Town. This plan should include consideration of hazard mitigation measures.

Multi-hazard

Q) Building Department Mutual Aide: The town should implement the Memorandum of Agreement for Mutual Aid among the Building Inspectors of Scituate and six neighboring towns. This action is a provision of the Scituate Building Department's Emergency Plan that has not yet been implemented.

Earthquakes

R) Municipal Building Assessment: Investigate options to make all public municipal buildings earthquake resistant.

Low Priority Mitigation Measures

Brush Fire

S) Phragmites Control: Phragmites plants are an invasive species that degrade the quality of wetland environments and present a brush fire hazard, especially in those areas where they grow close to existing businesses. The Town should investigate methods to control, cut, or eradicate Phragmites.

Wind

T) Boat Launch Repair: Repair and improve the boat launch site on Scituate Harbor in order to facilitate the removal of boats from the water in advance of a approaching large storm event.

Introduction to Potential Mitigation Measures (Table 16)

Description of the Mitigation Measure – The description of each mitigation measure is brief and cost information is given only if cost data were already available from the community. The cost data represent a point in time and would need to be adjusted for inflation and for any changes or refinements in the design of a particular mitigation measure.

Priority – The designation of high, medium, or low priority was done at the meeting of the Local Multiple Hazard Community Planning Team meeting. The designations reflect discussion and a general consensus developed at the meeting but could change as conditions in the community change. In determining project priorities, the local team considered potential benefits and project costs.

Implementation Responsibility – The designation of implementation responsibility was done by MAPC based on a general knowledge of what each municipal department is responsible for. It is likely that most mitigation measures will require that several departments work together and assigning staff is the sole responsibility of the governing body of each community.

Time Frame – The time frame was based on a combination of the priority for that measure, the complexity of the measure and whether or not the measure is conceptual, in design, or already designed and awaiting funding. Because the time frame for this plan is five years, the timing for all mitigation measures has been kept within this framework. The identification of a likely time frame is not meant to constrain a community from taking advantage of funding opportunities as they arise.

Potential Funding Sources – This column attempts to identify the most likely sources of funding for a specific measure. The information on potential funding sources in this table is preliminary and varies depending on a number of factors. These factors include whether or not a mitigation measure has been studied, evaluated or designed, or if it is still in the conceptual stages. MEMA and DCR assisted MAPC in reviewing the potential eligibility for hazard mitigation funding. Each grant program and agency has specific eligibility requirements that would need to be taken into consideration. In most instances, the measure will require a number of different funding sources. Identification of a potential funding source in this table does not guarantee that a project will be eligible for, or selected for funding. Upon adoption of this plan, the local committee responsible for its implementation should begin to explore the funding sources in more detail.

Additional information on funding sources – The best way to determine eligibility for a particular funding source is to review the project with a staff person at the funding agency. The following websites provide an overview of programs and funding sources.

Army Corps of Engineers (ACOE) – The website for the North Atlantic district office is http://www.nae.usace.army.mil/. The ACOE provides assistance in a number of types of projects including shoreline/streambank protection, flood damage reduction, flood plain management services and planning services.

Massachusetts Emergency Management Agency (MEMA) – The grants page http://www.mass.gov/dem/programs/mitigate/grants.htm has a useful table that compares eligible projects for the Hazard Mitigation Grant Program and the Flood Mitigation Assistance Program.

United States Department of Agriculture – The USDA has programs by which communities can get grants for firefighting needs. See the link below for some example.

http://www.rurdev.usda.gov/rd/newsroom/2002/cfg.html

Abbreviations Used in Table 16

FEMA Mitigation Grants includes:
- FMA = Flood Mitigation Assistance Program.
- HMGP = Hazard Mitigation Grant Program.
- PDM = Pre-Disaster Mitigation Program

ACOE = Army Corps of Engineers.

MHD = Massachusetts Highway Department.

EOT = Executive Office of Transportation.

DCR = Department of Conservation and Recreation

DHS/EOPS = Department of Homeland Security/Emergency Operations

EPA/DEP (SRF) = Environmental Protection Agency/Department of Environmental Protection (State Revolving Fund)

USDA = United States Department of Agriculture

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Table 16
Scituate Potential Mitigation Measures

Hazard Area	Mitigation Measure	Measure Type	Implementation Responsibility	Time Frame	Estimated Cost	Potential Funding Sources
High Priority						
A) Flood Hazard	Elevate Repetitive Loss Structures	Property Protection	Planning	2010-2015	Up to $50,000 per structure (Up to $10,000 for utility elevations)	FEMA
B) Flood Hazard	Hazard Mitigation Plan Coordination*	Prevention	Planning / Department Heads	2010-2015	TBD	Scituate
C) Flood Hazard	GIS Flood Area Mapping*	Prevention	Planning	2010-2012	TBD	Scituate
D) Flood Hazard	Protect Key Road Intersections*	Emergency Services Protection	Public Works	2010-2013	TBD	Scituate/FEMA
E) Flood Hazard	High Hazard Area Buy-Outs*	Property Protection	Planning	2010-2015	TBD	FEMA
F) Flood Hazard	Sea Wall Repairs*	Structural Projects	Public Works	2010-2015	TBD	Scituate
G) Flood Hazard	Culvert Maintenance*	Structural Projects	Public Works	2010-2015	TBD	Scituate

Table 16
Scituate Potential Mitigation Measures

Hazard Area	Mitigation Measure	Measure Type	Implementation Responsibility	Time Frame	Estimated Cost	Potential Funding Sources
H) Flood Hazard	CRS Participation	Public Education	CRS Coordinator	2010-2015	TBD	Scituate
I) Flood Hazard	Peggotty Beach Management Plan	Structural Projects / Property Protection	Planning / Public Works	2010-2015	TBD	FEMA/Scituate
J) Multi-Hazard	Public Education	Public Education	CRS Coordinator / Planning	2010-2015	TBD	Scituate
K) Multi-Hazard	Emergency Power Generators	Emergency Services Protection	Public Works	2010-2015	TBD	FEMA/Scituate
L) NFIP Compliance	Floodplain Management	Prevention	Planning	2010-2015	TBD	Scituate
M) NFIP Compliance	Floodplain Mapping	Prevention	Planning	2010-2015	TBD	Scituate
N) NFIP Compliance	Acquisition of Vacant Flood Prone Lands	Prevention / Natural Resource Protection	Planning	2010- 2015	TBD	FEMA / Scituate / DCR / Community Preservation Act
Medium Priority						
O) Flood Hazard	FEMA Training*	NA		2010-2013	TBD	Scituate
P) Flood Hazard	Coastal Management Plan	Prevention / Property	Planning / Recreation	2010-2013	TBD	Scituate

Table 16
Scituate Potential Mitigation Measures

Hazard Area	Mitigation Measure	Measure Type	Implementation Responsibility	Time Frame	Estimated Cost	Potential Funding Sources
		Protection				
Q) Multi-Hazard	Building Department Mutual Aide*	Emergency Services Protection	Building Department	2010-2012	TBD	Scituate
R) Earthquake	Municipal Building Assessment	Property Protection	Building Department	2010-2015	TBD	Scituate
Low Priority						
S) Brush Fire Hazard	Phragmites Control*	Natural Resource Protection	Conservation	2010-2015	TBD	Scituate
T) Wind Hazard	Boat Launch Repair	Emergency Services Protection	DPW	2010-2015	TBD	Scituate

*** Mitigation measures carried forward from the 2005 Scituate Hazard Mitigation Plan.**

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IX. PLAN ADOPTION AND MAINTENANCE

Plan Adoption

The Scituate Hazard Mitigation Plan was adopted by the Board of Selectmen on June 28, 2011. See Appendix D for documentation. The plan was approved by FEMA on [ADD DATE] for a five-year period that will expire on [ADD DATE].

Plan Maintenance

MAPC worked with the Scituate Hazard Mitigation Planning Team to prepare this plan. This group will continue to meet on an as-needed basis to function as the Local Hazard Mitigation Implementation Group, with one town official designated as the coordinator. Additional members could be added to the local implementation group from businesses, non-profits and institutions.

Implementation Schedule

Bi-Annual Survey on Progress– The coordinator of the Hazard Mitigation Implementation Team will prepare and distribute a biannual survey in years two and four of the plan. The survey will be distributed to all of the local implementation group members and other interested local stakeholders. The survey will poll the members on any changes or revisions to the plan that may be needed, progress and accomplishments for implementation, and any new hazards or problem areas that have been identified.

This information will be used to prepare a report or addendum to the local hazard mitigation plan. The Hazard Mitigation Implementation Team will have primary responsibility for tracking progress and updating the plan.

Develop a Year Four Update – During the fourth year after initial plan adoption, the coordinator of the Hazard Mitigation Implementation Team will convene the team to begin to prepare for an update of the plan, which will be required by the end of year five in order to maintain approved plan status with FEMA. The team will use the information from the year four biannual review to identify the needs and priorities for the plan update.

Prepare and Adopt an Updated Local Hazard Mitigation Plan – FEMA's approval of this plan is valid for five years, by which time an updated plan must be approved by FEMA in order to maintain the town's approved plan status and its eligibility for FEMA mitigation grants. Because of the time required to secure a planning grant, prepare an updated plan, and complete the approval and adoption of an updated plan, the local Hazard Mitigation Planning Team should begin the process by the end of Year 3. This will help the Town avoid a lapse in its approved plan status and grant eligibility when the current plan expires.

At this point, the Hazard Mitigation Implementation Team may decide to undertake the update themselves, contract with the Metropolitan Area Planning Council to update the plan or to hire another consultant. However the Hazard Mitigation Implementation Team

decides to update the plan, the group will need to review the current FEMA hazard mitigation plan guidelines for any changes. The update of the Scituate Hazard Mitigation Plan will be forwarded to MEMA and DCR for review and to FEMA for approval.

Integration of the Plans with Other Planning Initiatives

Upon approval of the Scituate Hazard Mitigation Plan by FEMA, the Local Hazard Mitigation Implementation Team will provide all interested parties and implementing departments with a copy of the plan and will initiate a discussion regarding how the plan can be integrated into that department's ongoing work. At a minimum, the plan will be reviewed and discussed with the following departments:

- Fire / Emergency Management
- Police
- Public Works / Highway
- Engineering
- Planning and Community Development
- Conservation
- Parks and Recreation
- Health
- Building

Other groups that will be coordinated with include large institutions, Chambers of Commerce, land conservation organizations and watershed groups. The plans will also be posted on a community's website with the caveat that local team coordinator will review the plan for sensitive information that would be inappropriate for public posting. The posting of the plan on a web site will include a mechanism for citizen feedback such as an e-mail address to send comments.

X. LIST OF REFERENCES

In addition to the specific reports listed below, much of the technical information for this plan came from meetings with Town department heads and staff.

Town of Scituate, General By-laws.

Town of Scituate, Zoning By-law.

Town of Scituate Flood Mitigation Action Plan, 2001.

MA Coastal Hazards Commission, Preparing For the Storm: Recommendations for Management of Risk from Coastal Hazards in Massachusetts, May 2007.

FEMA, Local Multi-Hazard Mitigation Planning Guidance; July 1, 2008.

FEMA, Flood Insurance Rate Maps for Scituate, MA, 2010.

Metropolitan Area Planning Council, Geographic Information Systems Lab.

Metropolitan Area Planning Council, Regional Plans and Data.

Horsley Witten Group, Town of Scituate Open Space and Recreation Plan, 2008.

LEC Environmental Consultants, Inc., Peggotty Beach Management Plan and Feasibility Study, 2008.

McGregor and Associates, Town of Scituate Master Plan, 2004.

Massachusetts StormSmart Coasts, website: http://ma.stormsmartcoasts.org/

New England Seismic Network, Boston College Weston Observatory, website: http://aki.bc.edu/index.htm

Northeast States Emergency Consortium, website: http://www.nesec.org/

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APPENDIX A
MEETING AGENDAS

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Don Boyce
DIRECTOR

Richard Sullivan
COMMISSIONER

Marc D. Draisen
EXECUTIVE DIRECTOR

SOUTH SHORE HAZARD MITIGATION PLANNING TEAM

Braintree
Cohasset
Hingham
Hull
Marshfield
Milton
Quincy
Randolph
Scituate
Weymouth

THE COMMONWEALTH OF MASSACHUSETTS

Deval Patrick, Governor

MASSACHUSETTS EMERGENCY MANAGEMENT AGENCY
400 WORCESTER ROAD, FRAMINGHAM, MA 01702-5399 508-820-2000 FAX 508-820-1404

DEPARTMENT OF CONSERVATION AND RECREATION
251 CAUSEWAY STREET, SUITE 600-900, BOSTON, MA 02114-2104 617-626-1250 FAX 617-626-1351

METROPOLITAN AREA PLANNING COUNCIL
60 TEMPLE PLACE, 6TH FLOOR, BOSTON, MA 02111 617-451-2770 FAX 617-482-7185

South Shore Hazard Mitigation Planning Team

First Meeting

Tuesday, February 9, 10:00 AM

McCulluch Building
(Whipple Senior Center)
Weymouth, MA
(See map & directions attached)

AGENDA

10:00 WELCOME & INTRODUCTIONS

10:05 OVERVIEW OF HAZARD MITIGATION PLANNING & GRANTS

- State Hazard Mitigation Plan & FEMA Grants–Sarah White, MEMA
- Regional & Local Mitigation Plans - Martin Pillsbury, MAPC

10:20 UPDATING THE SOUTH SHORE HAZARD MITIGATION PLAN

- FEMA Requirements & Grant Eligibility
- Review of Scope of Work & Schedule –MAPC
- Questions & Discussion – Local issues & Priorities

10:50 GETTING STARTED: MAPPING AND CRITICAL FACILITIES DATABASE FOR THE SOUTH SHORE PLAN UPDATE

- Chris Brown, GIS Analyst, MAPC

11:15 NEXT STEPS / ADJOURN

If you have any questions please contact Martin Pillsbury at MAPC:
617-451-2770, ext. 2012 or mpillsbury@mapc.org

Meeting Agenda
Local Multiple Hazard Community Planning Team
Scituate, MA

September 14, 2010 10:15 AM - 11:45 AM
Scituate Town Hall, 600 Chief Justice Cushing Way

---

1. Overview of Project Scope and Status.

2. Introduce Scituate Hazard Mitigation Planning map series and digitized ortho photo. Identify Flood and Fire Hazard Areas and areas of future potential development.

3. Review and Assess Plan Goals. (see over)

4. Discuss Public Involvement and Outreach (see over)

5. Set Date for Next Meeting to:

    1. Review Existing Mitigation Measures.

    2. Review Mitigation Measures from the 2005 Plan.

    3. Discuss Potential Mitigation Measures.

    4. Prioritize Mitigation Measures.

Project Overview - MAPC received a grant to update *Hazard Mitigation Plans* for the communities of Braintree, Cohasset, Hingham, Hull, Marshfield, Milton, Quincy, Randolph, Scituate, and Weymouth. MAPC is working with the ten communities to update plans to mitigate potential damages of natural hazards such as floods, winter storms, hurricanes, earthquakes, and wild fires, before such hazards occur. The federal *Disaster Mitigation Act of 2000* requires that all municipalities adopt a *Pre-Disaster Mitigation Plan* for natural hazards and update those plans every five years, in order to remain eligible for FEMA Hazard Mitigation Grants.

This FEMA planning program is separate from new or ongoing homeland security initiatives, and is focused solely on addressing natural hazards, although some of the data collected for this plan may be useful for other aspects of emergency planning as well.

Public Participation Options

1. Public web-based survey
2. Series of presentations by Town/City staff to local groups.
3. MAPC presents at a public meeting – existing board or commission*
4. Post on Town/City website with a set public review period.
5. Distribute to specified organizations or boards/commissions for their review.
6. Create a summary document and distribute in community

Sample Goals

1. Prevent and reduce the loss of life, injury, public health impacts and property damages resulting from all major natural hazards.

2. Identify and seek funding for measures to mitigate or eliminate each known significant flood hazard area.

3. Integrate hazard mitigation planning as an integral factor in all relevant municipal departments, committees and boards.

4. Prevent and reduce the damage to public infrastructure resulting from all hazards.

5. Encourage the business community, major institutions and non-profits to work with the Town to develop, review and implement the hazard mitigation plan.

6. Work with surrounding communities, state, regional and federal agencies to ensure regional cooperation and solutions for hazards affecting multiple communities.

7. Ensure that future development meets federal, state and local standards for preventing and reducing the impacts of natural hazards.

8. Take maximum advantage of resources from FEMA and MEMA to educate Town staff and the public about hazard mitigation.

Meeting Agenda
Local Multiple Hazard Community Planning Team
Scituate, MA

October 19, 2010 10:15 AM - 11:45 AM
Scituate Town Hall, 600 Chief Justice Cushing Way

---

a. Review Existing Mitigation Measures.

b. Review Mitigation Measures from the 2005 Plan.

c. Discuss Potential Mitigation Measures.

d. Prioritize Mitigation Measures.

e. Assign Final Review Team

Project Overview - MAPC received a grant to update *Hazard Mitigation Plans* for the communities of Braintree, Cohasset, Hingham, Hull, Marshfield, Milton, Quincy, Randolph, Scituate, and Weymouth. MAPC is working with the ten communities to update plans to mitigate potential damages of natural hazards such as floods, winter storms, hurricanes, earthquakes, and wild fires, before such hazards occur. The federal *Disaster Mitigation Act of 2000* requires that all municipalities adopt a *Pre-Disaster Mitigation Plan* for natural hazards and update those plans every five years, in order to remain eligible for FEMA Hazard Mitigation Grants.

This FEMA planning program is separate from new or ongoing homeland security initiatives, and is focused solely on addressing natural hazards, although some of the data collected for this plan may be useful for other aspects of emergency planning as well.

APPENDIX B
HAZARD MAPPING

The MAPC GIS (Geographic Information Systems) Lab produced a series of maps for each community. Some of the data came from the Northeast States Emergency Consortium (NESEC). More information on NESEC can be found at http://www.serve.com/NESEC/. Due to the various sources for the data and varying levels of accuracy, the identification of an area as being in one of the hazard categories must be considered as a general classification that should always be supplemented with more local knowledge. The documentation for some of the hazard maps was incomplete as well.

The map series consists of four panels with two maps each plus one map taken from the State Hazard Mitigation Plan.

Map 1.	Population Density
Map 2.	Potential Development
Map 3.	Flood Zones
Map 4.	Earthquakes and Landslides
Map 5.	Hurricanes and Tornadoes
Map 6.	Average Snowfall
Map 7.	Composite Natural Hazards
Map 8.	Hazard Areas

Map1: Population Density – This map uses the US Census block data for 2000 and shows population density as the number of people per acre in seven categories with 60 or more people per acre representing the highest density areas.

Map 2: Potential Development – This map shows potential future developments, and critical infrastructure sites. MAPC consulted with town staff to determine areas that were likely to be developed or redeveloped in the future.

Map 3: Flood Zones – The map of flood zones used the FEMA NFIP Flood Zones as its source. For more information, refer to the FEMA Map Service Center website http://www.msc.fema.gov. The definitions of the flood zones are described in detail on this site as well. The flood zone map for each community also shows critical infrastructure and municipally owned and protected open space.

Map 4: Earthquakes and Landslides – This information came from NESEC. For most communities, there was no data for earthquakes because only the epicenters of an earthquake are mapped.

The landslide information shows areas with either a low susceptibility or a moderate susceptibility to landslides based on mapping of geological formations. This mapping is

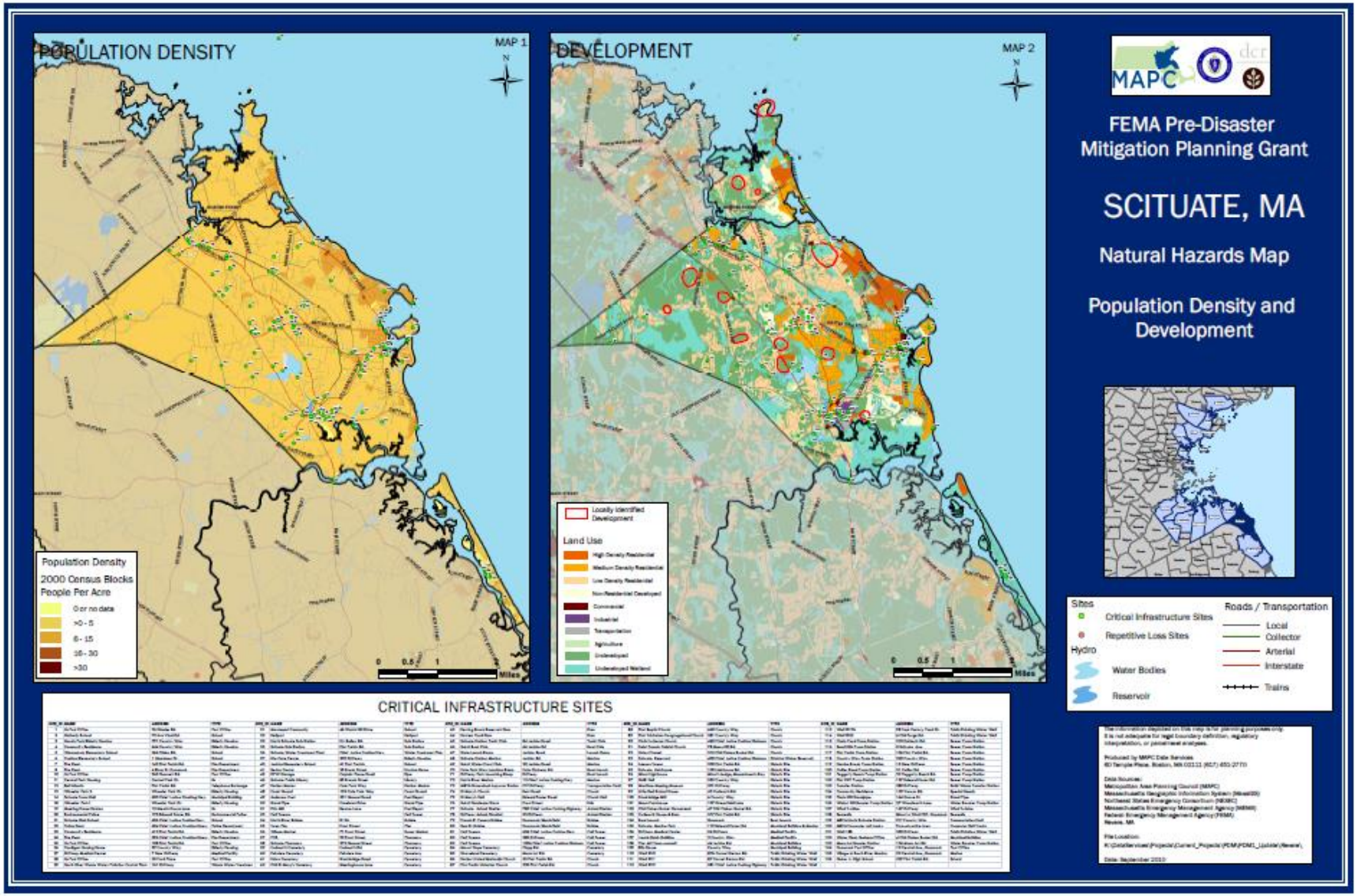
highly general in nature. For more information on how landslide susceptibility was mapped, refer to http://pubs.usgs.gov/pp/p1183/pp1183.html.

Map 5: Hurricanes and Tornadoes – This map shows a number of different items. The map includes the storm tracks for both hurricanes and tropical storms. This information must be viewed in context. A storm track only shows where the eye of the storm passed through. In most cases, the effects of the wind and rain from these storms were felt in other communities even if the track was not within that community. This map also shows the location of tornadoes with a classification as to the level of damages. What appears on the map varies by community since not all communities experience the same wind-related events. These maps also show the 100 year wind speed.

Map 6: Average Snowfall - - This map shows the average snowfall and open space. It also shows storm tracks for nor'easters, if any storms tracked through the community.

Map 7: Composite Natural Hazards - This map shows four categories of composite natural hazards for areas of existing development. The hazards included in this map are 100 year wind speeds of 110 mph or higher, low and moderate landslide risk, FEMA Q3 flood zones (100 year and 500 year) and hurricane surge inundation areas. Areas with only one hazard were considered to be low hazard areas. Moderate areas have two of the hazards present. High hazard areas have three hazards present and severe hazard areas have four hazards present.

Map 8: Hazard Areas – For each community, locally identified hazard areas are overlaid on an aerial photograph dated April, 2008. The critical infrastructure sites are also shown. The source of the aerial photograph is Mass GIS.


POPULATION DENSITY
MAP 1
DEVELOPMENT
MAP 2
MAPC
FEMA Pre-Disaster Mitigation Planning Grant
SCITUATE, MA
Natural Hazards Map
Population Density and Development
Population Density
2000 Census Blocks
People Per Acre
0 or no data
>0 - 5
6 - 15
16 - 30
>30
Locally Identified Development
Land Use
High Density Residential
Medium Density Residential
Low Density Residential
Non-Residential Developed
Commercial
Industrial
Transportation
Agriculture
Undeveloped
Undeveloped Wetland
Sites
Critical Infrastructure Sites
Repetitive Loss Sites
Hydro
Water Bodies
Reservoir
Roads / Transportation
Local
Collector
Arterial
Interstate
Trains
CRITICAL INFRASTRUCTURE SITES

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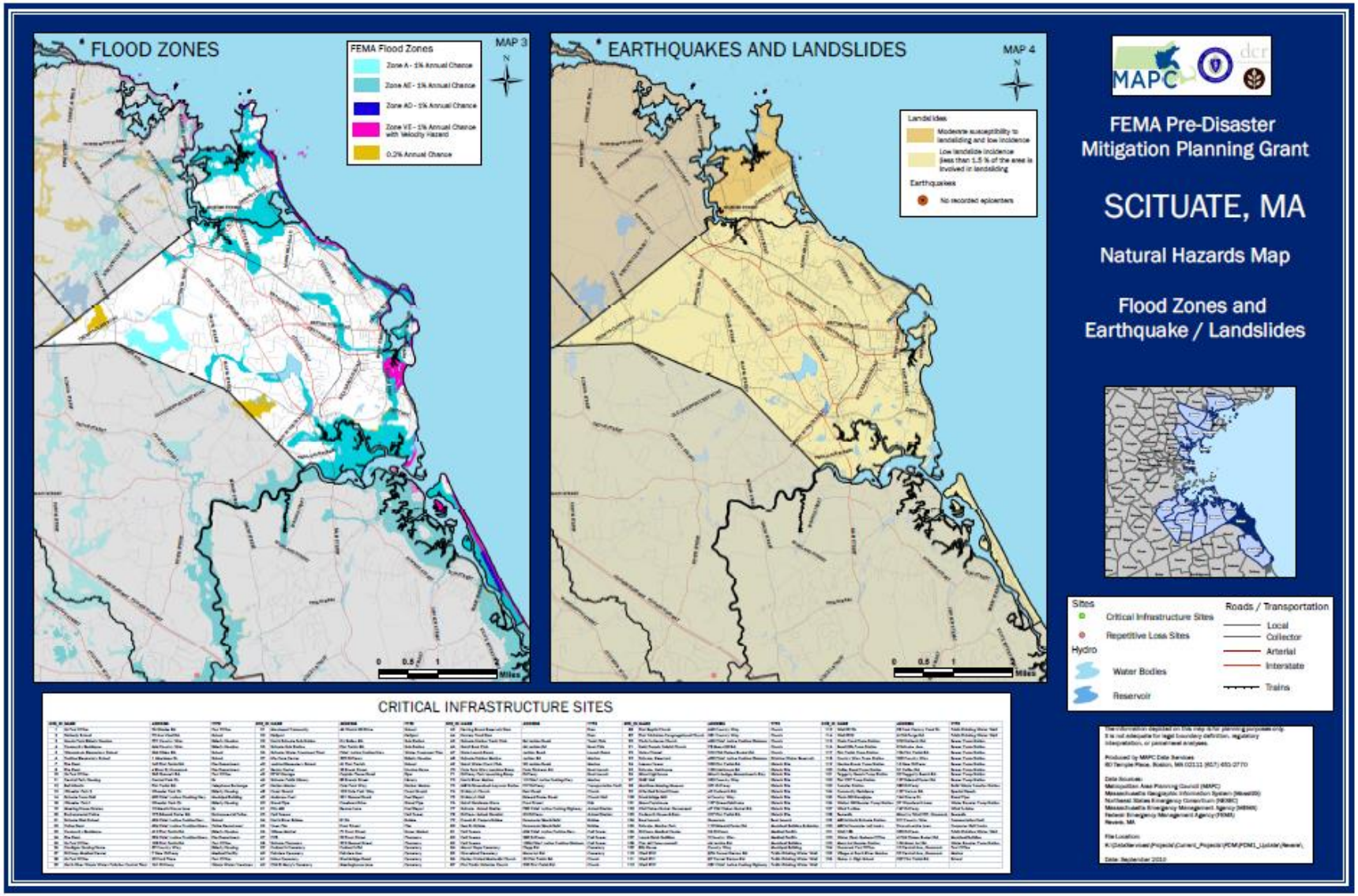
FLOOD ZONES
FEMA Flood Zones
Zone A - 1% Annual Chance
Zone AE - 1% Annual Chance
Zone AO - 1% Annual Chance
Zone VE - 1% Annual Chance with Velocity Hazard
0.2% Annual Chance
MAP 3
EARTHQUAKES AND LANDSLIDES
MAP 4
Landslides
Moderate susceptibility to landsliding and low incidence
Low landslide incidence (less than 1.5 % of the area is involved in landsliding
Earthquakes
No recorded epicenters
MAPC
FEMA Pre-Disaster Mitigation Planning Grant
SCITUATE, MA
Natural Hazards Map
Flood Zones and Earthquake / Landslides
Sites
Critical Infrastructure Sites
Repetitive Loss Sites
Hydro
Water Bodies
Reservoir
Roads / Transportation
Local
Collector
Arterial
Interstate
Trains
CRITICAL INFRASTRUCTURE SITES

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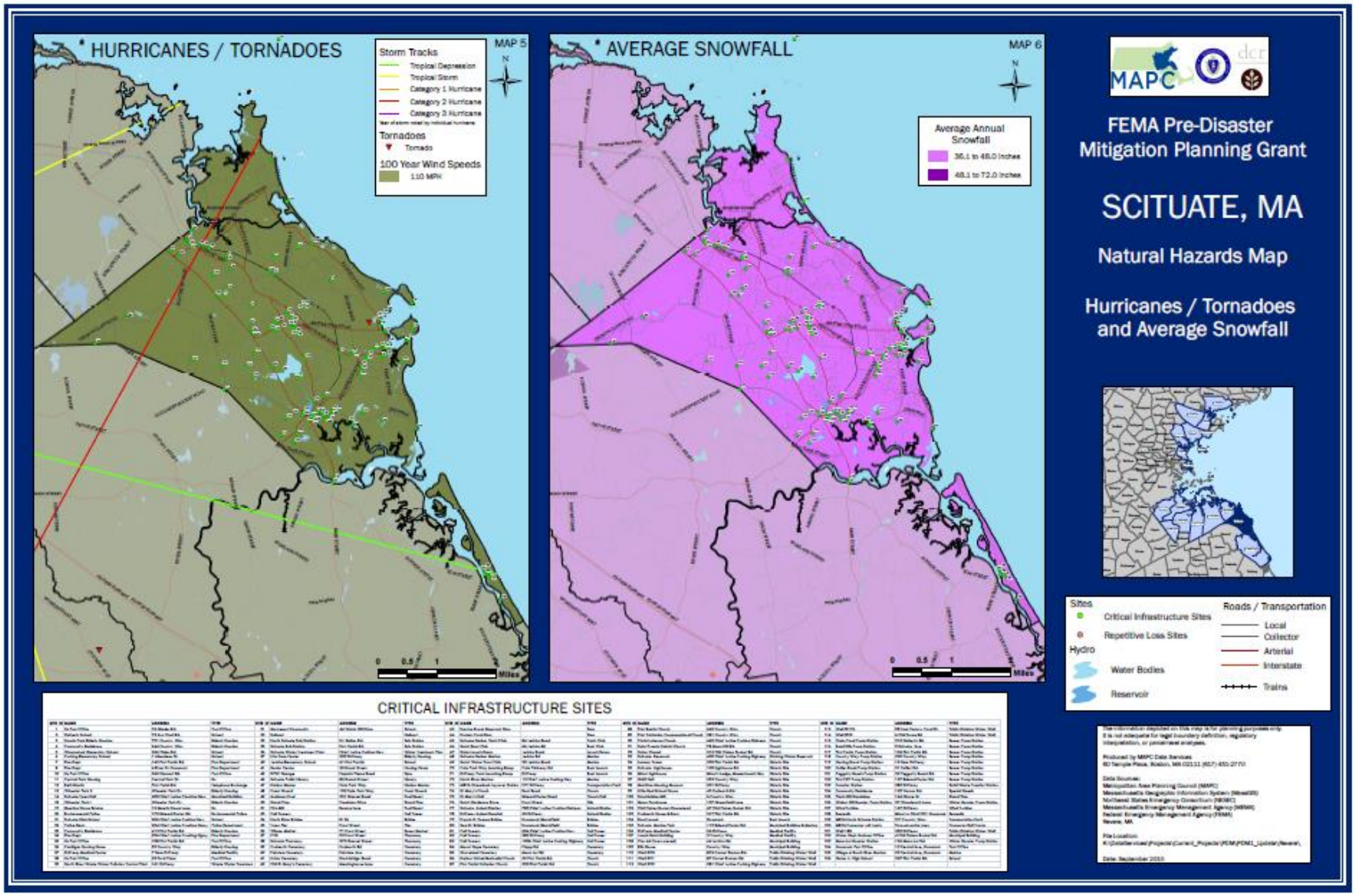
HURRICANES / TORNADOES
MAP 5
Storm Tracks
Tropical Depression
Tropical Storm
Category 1 Hurricane
Category 2 Hurricane
Category 3 Hurricane
Tornadoes
Tornado
100 Year Wind Speeds
110 MPH
AVERAGE SNOWFALL
MAP 6
Average Annual Snowfall
36.1 to 48.0 Inches
48.1 to 72.0 Inches
MAPC
dcr
FEMA Pre-Disaster Mitigation Planning Grant
SCITUATE, MA
Natural Hazards Map
Hurricanes / Tornadoes and Average Snowfall
Sites
Critical Infrastructure Sites
Repetitive Loss Sites
Hydro
Water Bodies
Reservoir
Roads / Transportation
Local
Collector
Arterial
Interstate
Trains
CRITICAL INFRASTRUCTURE SITES

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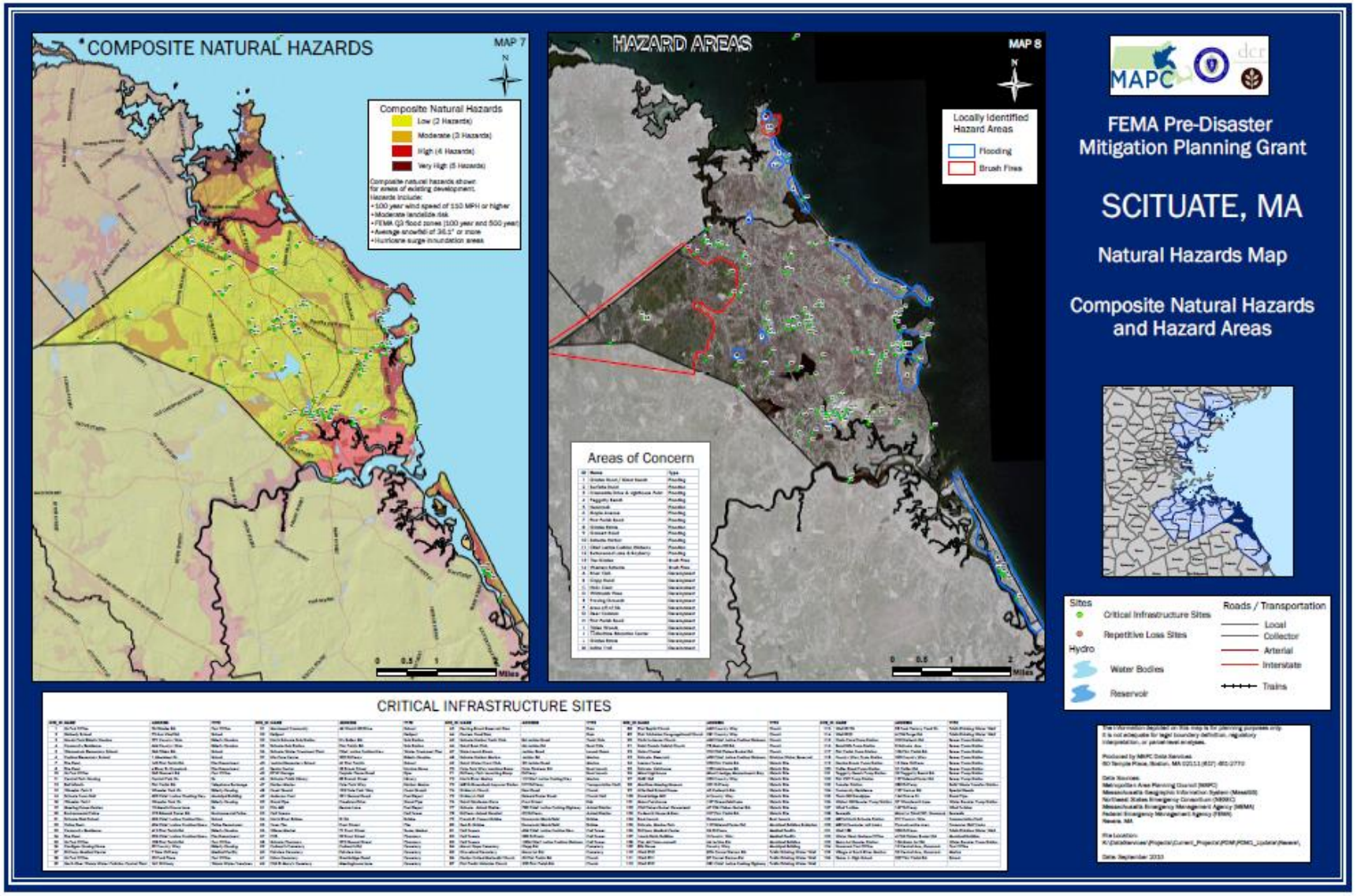
COMPOSITE NATURAL HAZARDS
MAP 7
Composite Natural Hazards
Low (2 Hazards)
Moderate (3 Hazards)
High (4 Hazards)
Very High (5 Hazards)
HAZARD AREAS
MAP 8
Locally Identified Hazard Areas
Flooding
Brush Fires
Areas of Concern
CRITICAL INFRASTRUCTURE SITES
MAPC
FEMA Pre-Disaster Mitigation Planning Grant
SCITUATE, MA
Natural Hazards Map
Composite Natural Hazards and Hazard Areas
Sites
Critical Infrastructure Sites
Repetitive Loss Sites
Hydro
Water Bodies
Reservoir
Roads / Transportation
Local
Collector
Arterial
Interstate
Trains

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APPENDIX C
DOCUMENTATION OF PUBLIC PARTICIPATION

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Scituate Planning Board

TOWN OF SCITUATE MASSACHUSETTS

AGENDA

SCITUATE PLANNING BOARD

Thursday, October 14, 2010

Selectmen's Hearing Room, Town Hall

7:30 P.M.

Presentation by James Freas, AICP, Regional Planner with Metropolitan Area Planning Council: Update of FEMA Hazard Mitigation Plan

8:00 P.M.

Town Planner Report

8:05 P.M.

Old Business, New Business, Correspondence, Administrative Items, Updates

• Accounting

• Approval of Minutes

8:10 P.M.

Discussion/Vote: Recommendation on Town Meeting Adoption of Stretch Code

8:30 P.M.

Public Hearing – Proposed Amendments to the Zoning Bylaw to allow Large Scale Ground Mounted Solar Photovoltaic Installations in the Commercial zoning district

Vote Recommendation to Town Meeting on Zoning Amendment

ADJOURNMENT

William Limbacher, Chairman

TOWN OF SCITUATE

BOARD OF SELECTMEN

600 Chief Justice Cushing Hwy.
Scituate, Massachusetts 02066
Telephone (781) 545-8740
Fax (781) 545-8704

MEETING OF THE BOARD OF SELECTMEN

TUESDAY, NOVEMBER 16, 2010

SELECTMEN'S CHAMBERS – TOWN HALL

7:00 PM

1. 7:00 PM/ MEETING CALLED TO ORDER

2. ACCEPTANCE OF AGENDA/ WALK-IN PERIOD

3. 7:05 PM/ DISCUSSION/ VOTE/ SET RESIDENTIAL FACTOR/Board of Assessors

4. DISCUSSION/VOTE/ NEW LICENSES
   - B & C Restaurants, d/b/a Riva Pizzeria, 765 Country Way - Common Victualler
   - Fani, Inc. d/b/a Sam's on the Harbor, 146 Front Street – Common Victualler
   - Ellen DeLuca, 2 Richfield Road Ext – Hawker/Peddler/ Hot Dog Cart
   - John Donovan, Jr., d/b/a Wilbur's North – Hawker/ Peddler/ Ice Cream Truck

5. DISCUSSION/ VOTE/ Green Communities Policy/ L. Harbottle
   (a) Energy Reduction Plan
   (b) Fuel Efficient Vehicle Policy

6. 7:30 PM/ PUBLIC HEARING/ Sewer Betterment Division/ 18 Lincoln Ave & 37 Moorland Road

7. DISCUSSION/ VOTE/ THREE(3) ITEMS/ SCITUATE FIRE DEPARTMENT
   (1) Intermunicipal Agreement/ Purchase of 1987 Pumper Truck
   (2) Acceptance of Chapter 48, Section 59A/ Mutual Aid
   (3) Increase to Permit Fee Schedule

8. PRESENTATION/ Hazard Mitigation Plan/ MAPC

9. DISCUSSION/ VOTE/ FY 12 BUDGET CALENDAR

10. ACCEPT RESIGNATION/ Conservation Commission

11. UPDATE/ TOWN OF SCITUATE 375TH ANNIVERSARY CELEBRATION

12. OTHER BUSINESS
13. CORRESPONDENCE
14. MINUTES
15. PENDING LITIGATION & LABOR NEGOTIATIONS (non-union)/Exec. Sessions
16. ADJOURNMENT

John F. Danehey, Chairman

APPENDIX D
DOCUMENTATION OF PLAN ADOPTION

DOCUMENTATION OF PLAN ADOPTION

Town of Scituate

BOARD OF SELECTMEN

781-545-8740
781-545-8704 (fax)

CERTIFICATE OF ADOPTION

A RESOLUTION ADOPTING THE TOWN OF SCITUATE HAZARD MITIGATION PLAN

WHEREAS, a Local Hazard Mitigation Planning Committee, composed of staff from a number of different Town departments, worked with the Metropolitan Area Planning Council to prepare the Hazard Mitigation Plan; and

WHEREAS, the Town of Scituate Hazard Mitigation Plan contains several potential future projects to mitigate potential impacts from natural hazards in the Town of Scituate, and

WHEREAS, a duly-noticed public meeting was held by the Board of Selectmen on November 16, 2010, and

WHEREAS, the Town of Scituate authorizes responsible departments and/or agencies to execute their responsibilities demonstrated in the plan, and

NOW, THEREFORE BE IT RESOLVED that the Town of Scituate Board of Selectmen adopts the Town of Scituate Hazard Mitigation Plan in accordance with Article 5, Section 5-1 of the Charter of the Town of Scituate.

ADOPTED AND SIGNED THIS TWENTY-EIGHTH DAY OF JUNE, TWO THOUSAND AND ELEVEN.

TOWN OF SCITUATE
BOARD OF SELECTMEN

Anthony V. Vegnani, Chairman

John F. Danehey

Shawn Harris

Richard W. Murray

Joseph P. Norton

Bernice R. Brown, Town Clerk